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SPECIAL MEETING OF THE JOHNS HOPKINS HOSPITAL HISTORICAL CLUB

Presentation to the Hospital of Memorial Plaque of Sir William Osler

January 19, 1925

A Special Meeting of the Johns Hopkins Hospital Historical Club was held in the Medical Amphitheatre on Monday, January 19, 1925, at 8:30 p.m., at which the Memorial Plaque of Sir William Osler was presented to the hospital.

The meeting was called to order by the President, Dr. Howard A. Kelly.

PROGRAMME

1. Sir William Osler: Teacher and Student.....Dr. Rufus Cole
2. Osler: Student and Teacher of Disease..Dr. William H. Welch
3. Presentation of the Plaque on Behalf of the Subscribers
   Dr. Thomas McCrae, Philadelphia
4. Acceptance of the Plaque on Behalf of the Johns Hopkins Hospital and Trustees.....Judge Henry D. Harlan

Dr. Kelly: Our meeting tonight is something of a memorial celebration for one whom many of us have known intimately and whom all of us have loved, whose memory is always dear to us; one who can hardly in this meeting be said to be absent, for he had a presence which has continued with us of the medical profession, with his friends and their friends ever since he left this world for the other side.

Dr. Osler had that remarkable gift of winning the hearty, permanent affections of all who knew him.

Tonight we come here for the unveiling of the tablet and a few appropriate brief addresses leading up to it. If Dr. Hurd, who knew Dr. Osler, I venture to say, before any one else here present, is with us, I would be very glad if he would say a word or two to open the meeting.

Dr. Henry M. Hurd: In speaking to Dr. Kelly recently, I mentioned the fact that I thought I had met Dr. Osler earlier than any other person connected with the John Hopkins University. I remember that in 1884 I accepted an invitation from a college friend and classmate to visit Canada, and after wandering about in

various out-of-the-way places we visited Montreal, where I first saw Dr. Osler. He was then extremely bright and active. He was, I think, more active than we ever knew him to be afterward. He knew everybody and as usual was on good terms with everyone, being interested in medicine, politics and seemingly in everything. As a result of this interview, I attended the annual meeting of the Canadian Medical Association at Kingston, of which he was secretary. He proved to be an excellent executive, and was very active. In fact he carried on the work of the Association. I attended one business session where it appeared that many of the members of the Association were in arrears and asked for a remission of the dues. Dr. Osler had no mercy for them and made a motion regularly that they be required to pay up, which was of course a great pecuniary advantage to the Association. It was delightful to see how Osler was able to take charge of the meeting and how, when they wandered off into by-paths, he would bring them back to the business under discussion. Everybody liked him and he was a great force as well as a great favorite. I never thought that his associates would permit him to leave Canada, but they evidently could not prevent it and we eventually had the benefit of the greatest vivifying force that ever came to the United States.

Dr. Kelly: Dr. Thayer, so long Dr. Osler's associate, is unfortunately laid up with bronchitis and cannot be here. Dr. Welch will say a word about a proponent he has in mind if he can get him to take Dr. Thayer's place.

Dr. William H. Welch: I am not quite sure whether this proponent (Dr. Cole) will respond. When I was in New York on Saturday I said to him that I thought not enought stress had been laid on Osler's work as a student of disease. Not too much can be said about his inspiring personal qualities and character, but after all he was primarily a teacher, a student of disease. Dr. Cole said, "Well, I have written on that subject myself and agree with you." He disappeared and brought back a manuscript of what seems to be an extremely suitable paper for this occasion. I am very generous in suggesting that he read the paper because the subject matter, or the general line of thought which he has followed, was about that which I had thought of taking up. Hearing that Dr. Cole was here an hour or so ago, I told him of this plan and handed him back the manuscript.

As Dr. Thayer is not here, with all his charm of expression in talking of Osler as the clinician, the teacher, I think no better substitute can be found than Dr. Cole—himself a product of the Osler school, a graduate, as you know, of our School, who left to become the Director of the Hospital of the Rockefeller Institute, certainly one of the most progressive places in this country, indeed in the world, in clinical research, and I think you will be grateful if Dr. Cole will consent to appear in this capacity.

Dr. Rufus Cole: I am sure that Dr. Welch could say extemporaneously much better what I have to say about Dr. Osler, but he has insisted that I read these lines which I wrote a couple of months ago and which I have not had an opportunity to write over again.

SIR WILLIAM OSLER: TEACHER AND STUDENT[1]

"It would seem, Adeimantus, that the direction in which education starts a man will determine his future life."[2]

—PLATO, *Republic* IV.

One sometimes fears that the student of the history of medicine in the years to come may have some difficulty in judging the character and value of Sir William Osler's contribution to this branch of learning. He was a man of such wide and varied interests and his avocations were so numerous that there is danger that his contemporaries who were not intimately associated with him during his years of greatest medical activity may fail to give proper consideration to his activities in his real vocation, that of a teacher of students of medicine.

He had a great capacity for impressing all those with whom he came in contact, he had great literary skill and, consequently, reached many who had no direct contact with or interest in medicine. As a result, in his later years his circle of admirers and friends reached far outside the bounds of the medical profession. To many of these his work as a teacher of medicine represents only a subordinate aspect of a many-sided life. In the minds of many he undoubtedly appears as a learned historian, as a classicist, as a bibliophile, as a unique and striking personality, as a wise counsellor in wordly affairs, as a sympathetic and lovable friend, or as an able physician. Truly, he was all of these things but, in addition, he was a great teacher of medicine, and as a teacher he made an extraordinary impression on the character of the medical profession of his time. During his lifetime a great change occurred in the medical profession in the United States; the methods of teaching medicine were revolutionized, and while other factors played a part in the transformation, certainly much can be directly traced to his influence. Is it not possible that those who look upon the great honors which fell to him during his Oxford years as the crowning glory of his career may not fail as grievously in appraising his life as have the Philistines who know of him chiefly as the author of a theory regarding old age?

Time only can reveal which of the various channels through which flowed his great personality were cut most deeply and permanently, but it seems most likely that it was as a student and teacher of medicine that he made the greatest impression on his time, and that it is through the results of his teaching, transmitted through the medium of his students, that his effect upon posterity will be most significant.

He himself would have been the last to analyze his methods or to discuss their wider significance. He preferred to act and to allow others to draw conclusions and inferences. It is possibly, therefore, not an entirely gracious task to dissect the methods he employed in teaching, and to discuss the character of the influence

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[1] This address was written for the Sir William Osler Memorial Volume of the International Association of Medical Museums, and also appears there.

[2] Motto quoted by Osler for his address with the above title.

which he exerted upon medical progress. Nor do I feel competent to do this. Nevertheless, in these few inadequate lines, I should like to recall his contribution to medical education, to medical progress, and to the science of medicine, rather than to dwell upon his great personality, or on his ability to inspire admiration and love, even that akin to worship. These qualities, of such paramount importance in a teacher, he possessed in an extraordinary degree, but the world has seen many other teachers of medicine possessed of these magnetic qualities, who nevertheless exerted very little influence in the direction of progress or true enlightenment. He, however, was able not only to attract and entertain, but was able, in addition, to stimulate that interest which impels men to study and think independently. Above all, he was able to demonstrate an effective method of study to be employed. That he could do this successfully is shown by the large number of the leading students of medicine of the present generation who were his pupil and who received from him their chief inspiration.

This ability to transform crude unthinking youths into serious students was not the result of mere chance or the manifestation of a kind gift from the gods. Osler created students, because he himself was a student. The laws of conservation apply in intellectual and spiritual realms as surely as they do in the physical world. No one gives out more than he receives. The most effective teaching is through example. To write in a delightful and entertaining way of the "Master Word" is splendid, but what really stimulated his students was the knowledge that he had gained his own power through travail and effort. The daily observation of his unremitting effort to gain more knowledge concerning disease stimulated imitation. Those who knew him in his youth, and during his Montreal days when he was studying pathology, have told us of his great industry. We who as pupils and assistants attempted to follow him day by day realized only too well the enormous intensity with which he entered into every task.

But he did not expend energy undirected. He had the true spirit of the student, of the investigator, and his activities conformed to one of the methods of scientific investigation. Lord Kelvin has distinguished between two stages in the progress of science, the "Natural History" stage and the "Natural Philosophy" stage, the stage of observation and description, and the stage of generalization and formulation.

During the nineteenth century most of the biological sciences, certainly medicine, was in the "Natural History" stage. Dr. Gwyn has told in a splendid way of the early influences which directed Dr. Osler as a youth to the study of natural history. He early learned how to observe and to classify, and he employed this scientific method in all his later investigations. For Dr. Osler medicine was a descriptive science and the nosographic method was of prime importance in the study of diseases. He recognized, as Faber has stated, that "to the clinician it is essential; he cannot live, speak or act without the concept of morbid categories." But although Dr. Osler made important contributions to nosography, as witness his study and analysis of the erythema-purpura group of diseases, yet it was in accurate observation and description that he was most interested, leaving to others

discussions regarding the establishment of new classifications. Only those who were in intimate contact with him during his working hours in the wards can realize the remarkable power of observation and the skill in discriminating between the important and the unimportant which he developed. Added to this was a very remarkable facility in description, extremely accurate, yet highly picturesque and interesting. These are the qualities which it seems to me are outstanding (rarely combined in such a happy manner in one individual), and these are the qualities which stamp him as a great scientist. Moreover, it was through these qualities—the love of work, the ability to observe accurately and describe clearly—that he made his greatest impression upon his students and upon the medicine of his day.

I have always felt that in his third year clinic Dr. Osler reached the high-water mark of clinical teaching,—that indeed he here spoke the last word in the teaching art. This was not the conventional clinic,—a lecture or demonstration. Instead, he became one of a group of students, none of whom except himself had any knowledge of disease except that acquired from the study of dead tissues. Together they observed and described sick human beings. The special examples studied he himself had not previously seen, but they were chosen at random by his assistants from among those applying for treatment. One student was chosen to conduct the examination under Dr. Osler's direction, though each of the members of the class quickly became as interested and keen as though he were personally making it. By skilful direction the students were guided in detecting the particular features in which the patient differed from the normal. Dr. Osler looked and the students looked with him. Then they were guided in reasoning from effect to cause and from cause to effect. They were initiated into the method of Zadig. It was all like taking part in the most fascinating game, and it was all conducted as informally as a game. But it was the ideal application of a fundamental method of scientific investigation. The game did not end with observation. The students were directed to keep accurate notes, not from dictation, but to keep their independent records of their own observations. I have no doubt that many of the students wrote better descriptions during those third year clinics than they have ever composed since. Some of them in after life became careless—some probably now keep no notes at all,—but on many or most of these men there was indelibly impressed the importance of careful observation and accurate description.

The students were also skilfully directed towards the methods to be employed in obtaining first-hand information from the literature—even the ancient literature—regarding the observations of others on identical or analogous phenomena. They were called upon to follow the patients to their homes and observe the progress of the abnormalities they had observed; and these observations had to be reported to the class. By the end of the course a student had not only learned the methods of clinical study, but, because each patient had been stamped on his memory as well as recorded in his notes, he had acquired an experience such as many physicians do not obtain after years of practice. This method has since been imitated by many other teachers. But Dr. Osler's third year clinic marked a distinct advance in clinical teaching in this country. Students were taught to

observe, record and think. It brought into the teaching of clinical medicine the scientific method.

The ward rounds and fourth year clinic never seemed to me quite so successful or original, though they were models of their kind. It is true that the ward rounds partook much of the character of the third year clinic, but much more stress was laid on memory tests, upon the classification and grouping of symptoms and signs, large for mnemonic purposes. While such expedients are undoubtedly of great value to the student, yet they are probably not of great importance in arousing interest or developing scientific methods.

I have had the opportunity only to hint at certain of the methods employed by Dr. Osler. What I have tried to emphasize is that he was a great student of clinical medicine, one of the greatest since Sydenham, and a very great teacher of medicine, possibly the greatest since Boerhaave. He wrote a treatise on clinical medicine that will long remain a model. In his study of disease he employed the "Natural History" method, the method of systematic botany and zoology, the method of Linnaeus and of Agassiz. At the present time there is a tendency to treat this method in a step-sisterly fashion. It must be borne in mind, however, that in the development of all the sciences, data must be first collected. Generalizations then follow. In the study of medicine in its broader aspects, or of pathology, accurate knowledge of clinical phenomena is of the greatest value. To study the more superficial features of disease accurately and in the scientific spirit is a task worthy of the greatest minds.

Dr. Osler was not a student of the fundamental processes underlying clinical phenomena. There were few clinicians in the world who were engaged in these problems in his day. The water has flowed swiftly under the bridge during the past decades. The medical student of today is considering problems of ever increasing complexity and in applying the descriptive method he now must make use of the most complex aids to the senses. The experimental method is now the vogue. Dr. Osler was not unconscious of the changing order. He constantly urged the use of laboratory methods when they were of assistance, and it was directly through his influence, as the writer knows, that many fundamental changes in the teaching of medicine and in the investigation of disease have taken place. He showed his everlasting youth by never opposing change. While he sounded the danger of precipitancy, yet he ever welcomed the new.

Let us never forget in our love for him as a man and in our admiration of his versatile, striking personality that he was one of the great students of medicine and one of its greatest teachers. He has made an impression on clinical medicine and on medical education for all time.

OSLER: STUDENT AND TEACHER OF DISEASE

Dr. William H. Welch: Mr. Chairman, Ladies and Gentlemen: I think you will agree with me that it was a remarkable piece of good fortune that Dr. Cole was here with that paper, for it seems as though it were written for the occasion. I

do not see how it could have been better. He took, however, exactly the subject I had in mind. He had the same thought, namely, that while in a sense not too much can be said of Osler's great personal qualities and versatility, his example and inspiration, yet, after all, a man's permanent place in history is not secure as a matter merely of personal tradition, important as that is. And I think with the numberless tributes to Osler one misses exactly the note which Dr. Cole has struck here tonight: that is, there was a very solid, substantial basis in his methods of teaching and of study, that he has indicated genuinely scientific methods and spirit, a scientific basis which should be brought out clearly as the real basis of his fame as a clinician, a student of disease.

Dr. Osler, in his last address before leaving this country in 1904, at that great dinner given to him in New York City to which physicians and friends from this country and from Canada came in large numbers—a very beautiful and touching address—said that there were two great ambitions in his professional life. One was to become a good clinician, and he cited those among whose ranks he would like to be numbered, beginning with Nathan Smith, followed by Rush, Bartlett, Jacobi, Andrew Clark, Austin Flint, William Pepper and Alfred L. Loomis.

His second ambition, he said, was to build up a great clinic along lines different from those hitherto followed in this country or in England, that is, along Teutonic lines. In Germany, where he had studied, he had become well acquainted with such clinics embodying the spirit of scientific medicine.

His great opportunity to build such a clinic and to establish his reputation as a clinician, more than worthy to rank with any name that I have mentioned in that list, came to him here in Baltimore, and I think it is we especially that should lay particular emphasis upon this side of his professional life.

It is worth considering what the character of Osler was as a good clinician, and what were the distinctive features of the clinic which he established here at the Johns Hopkins Hospital and Medical School. He had, as I think Dr. Cole has mentioned, the spirit of a naturalist. His early contributions and inspirations were in the field of natural history. He was not given to philosophical speculations or generalizations, not even searching deeply for the underlying causes of things, but delighted in manifestations of life—a very charming type and a genuinely scientific type, although belonging to the naturalist stage in the development of science. He came from the laboratory into clinical medicine. He spent years of work in the dead-house as a student of morbid anatomy. He was also interested to some extent in physiology. He studied at University College in London, and was himself Professor at McGill in the Institutes of Medicine, covering mainly physiology. He belongs to the type to which nearly all of the great clinicians who reached the highest degree of success in their calling, belonged,—men who had spent their early years in study, particularly in morbid anatomy and pathology. That is the lineage of the great English clinicians—of Bright, Addison, Hodgkin. The method was introduced by Laennec, the founder, in a sense, of modern clinical teaching, one who had the great opportunity to combine clinical observation with anatomical findings, and who greatly aided by the introduction of these methods

into physical diagnosis. And the succession from Laennec on through Louis and Trousseau—that is the line to which Osler belongs.

The same is true in Germany beginning with Schönlein, the founder of the type of clinic that Osler had in mind, the place where disease is studied in the method and in the spirit of science. Traube stands a little to one side, rather representing the experimental spirit, but Gerhardt and Nonne—they are all of this generation,—and I think history probably will justify the statement that Osler represented the culmination of that generation and that school, of that type of tradition—and a fine type it was indeed!

He was aware, as Dr. Cole has intimated, that a change was coming. The change was due not so much to discoveries in medicine as to discoveries in other sciences, particularly in chemistry, in immunology, and in experimental physiology. So that the newer generation, the newer type, is of a different character from the one that I have in mind. I think he was aware of this change. He had no lack of appreciation of important discoveries in science, no lack of appreciation of what the new chemistry was going to mean as indicating a line of attack, and a much more fundamental line of attack, upon the problems of disease.

Dr. Cole has very beautifully brought out his qualities as a teacher. One quality he had in an eminent degree—the best quality that a teacher can have, in my judgment—that is, the gift of interesting the student in the subject of study. If you can really interest him, it is easy for you: the problem is robbed of its difficulties. He brought this about by the method which Dr. Cole has pointed out so clearly.

He has a reputation, as you know, quite apart from that of the clinician, as a great student of the history of medicine. He ranks really as a man of literary reputation. He had a genuine literary gift so that his writings are even touched upon seriously by literary critics in the matter of style. Sometimes I have heard Professor Gildersleeve speak of it as an 'allusive' style. One must know his Bible very well in order to read intelligently the citations and allusions in Osler's writing. I would like to point out in this connection that he used this historical method of approach to the study of disease not merely as an inherent interest, but as a method of education. I think there is nothing better than that line of approach to a subject, not to have a student take things as if the knowledge had always existed, but to be interested in how the knowledge came to be, its growth, evolution and the names permanently identified with it. He inspired one of his pupils, Camac, to write a book on the Ethical Contributions to Medicine, with citations from the original sources. I simply point out in this connection, important as it is, that he was a medical historian of the very first rank, and a serious student of medical history, and that it was also a part of his educational method.

Within a year after the Hospital was opened in 1889, our Historical Club was founded, mainly through his inspiration and leadership, and it remains really a bright light in cultivating an interest in the history of medicine, such as didactic lectures in that subject are incapable of doing.

Now, he had these wonderful qualities as a teacher, but his influence, as Dr. Cole

has said, was chiefly due to his example. He was a student with the students. He himself was studying the problems of disease as presented by the patient. One speaks of it as the method merely of accurate observation. It is much more than that. That, in a sense, is all there is to the scientific method, because an experimentation is merely observation under carefully controlled conditions. The opportunities for accurate observation are no greater under experimental conditions than they are under the manifestations or phenomena of disease as they present themselves directly to you, but an observation means far more to us today than it did to the great Greek physicians, to Hippocrates and to Galen. Perhaps we do not surpass them in some things, but what did a rapid pulse or cyanosis mean to them? With our accumulation of knowledge, the feeling of a pulse today means more than it could have meant to Hippocrates. It is difficult for us to think way back to the time before the circulation of the blood was known. How could they have interpreted those matters? Osler had all of that broad knowledge and he had the power of interpreting observations as they were presented to him in the phenomena of disease. But without that increasing knowledge which comes from physiology and anatomy and pathology, medicine—pure observation—would not go very far. It is almost impossible to identify diseases, admirable as the descriptions are, in the writings of antiquity. You can identify malarial fever, phthisis but there are very few of the disease that you can positively identify. At our stage in the history of medicine science means a very different thing from what it could have meant before these advances had been made through the collateral sciences.

A great clinic. He said he wanted to build up a great clinic after the Continental model, and distinctly said it was to be along lines different from those previously followed in this country and in England. He meant by that a place where medicine is not only taught but where it is advanced; where there is a study of disease as one of the primary functions of the clinic; a place where there is the example of the teacher engaged in the study of disease, where he is surrounded by ardent and capable assistants inspired by his example. It remains to be seen whether the newer, experimental, and physico-chemical attack upon disease, is going to breed a generation of clinicians as broad in their interest as those of the older type. I do not discuss that matter here, but I think the tendency is rather to concentrate upon a particular group of diseases.

Think of Osler in the whole field of medicine. His contributions have never been gathered and it would be a gigantic labor really to do any sort of critical justice to them. I do not think there will be found any great revolutionary discoveries, such as Pasteur, Koch or even Laennec have made, but what a multitued of observations, and how many of them are certainly significant; I think they should be treated and catalogued just as is being done for his library. It will require some one who knows the history of medicine, and he will find certain groups of diseases, like the erythema-purpura group, to which valuable contributions have been made. Loyalty to him and to his fame demand that this should not be neglected.

A clinic was really created here. In 1889 the Hospital was opened. We were greatly disappointed then that the Medical School was not started at the same time. I had been here five years before Osler and had been hoping that the School would be opened at the same time that the Hospital was started, but it was not. And as I see it now, I think those four or five years of the organization of the hospital and of the hospital staff, without the medical school, was an advantage. Then was organized the hospital staff on the basis of permanent residents, or residents of indefinite tenure, and assistant residents' positions. There for the first time in this country was the opportunity for clinicians to be appointed and to study as assistants, being trained in anatomical, pathological and physiological branches. There was the opportunity, without engaging in practice outside the hospital, to secure a prolonged and thorough training exactly as a man who hopes to make himself an anatomist or a pathologist should have in years of apprenticeship. You cannot really get it by being attached to the outside hospital service or simply working in the wards. This was a great contribution to the Johns Hopkins Hospital, which was fully established before the medical school was opened in 1893. I think it is fair to say that Osler started a clinic along the lines such as he aspired to, in which the spirit and methods of science were applied to the study of disease, in which he himself illustrated the right method and spirit, inspiring a remarkable group of capable young men who were attracted here. And those were delightful days! Weren't they, Dr. Kelly? Those early days were less complicated than today, much simpler everywhere, more leisure and time to think. One of Osler's delightful addresses—I think it is called "Teaching and Thinking"—says that there should be time to think.

Think of the work that was done, beginning with the studies on malaria, and those of Councilman and Lafleur on dysentery. Think of the first volume of the Hospital Reports that came out—it was really the second, for the first was devoted to pathology. It contained Osler's studies of typhoid fever, a carefully detailed description and observation. As I heard Dr. McCrae say tonight, I do not believe typhoid fever was ever studied as it was then. So here was set the example of what a good clinic should be. Osler himself had more leisure. As time went on he became more and more called upon for consultation work. No one was so eagerly sought after by physicians; he was the Doctors' Doctor. They wanted him for themselves and for their families. Osler had a keen sense of responsibility which would allow him never to neglect the work of the hospital and the teaching. As long as he was here the students never suffered, the patients never suffered because of the demands upon him, which he tried to keep at arm's length as much as possible, but it was a bigger strain than he could stand or any man could stand. He could not have carried the burden much longer, the fourfold load, the conduct of the clinic, the investigations, the responsibilities of the patient and the outside practice. It could not have been done. But, as I say, he remained loyal primarily to the great responsibilities of the hospital.

Now, these two great ambitions, which he said were the ambitions of his professional life, were attained in full measure. He was happy, happy in his work,

happy in the affection of his colleagues and his friends throughout the world. We cannot have too many memorials to Osler. There should be a lecture upon him here every year by somebody. Somebody should talk to the students about him, for his life is ever an inspiration, but I think as a memorial, the medical clinic should be called for all time The Osler Clinic.

These are some of the thoughts I had in mind. They represent merely an attempt to bring out aspects of his life and character which he has himself indicated were his primary rules and which I cannot help but feel are in some danger of being submerged in an emphasis of the marvelous qualities of his personality, his leadership, his interest in so many different fields, and the tradition which he has left behind.

PRESENTATION OF THE PLAQUE ON BEHALF OF THE SUBSCRIBERS

Dr. Thomas McCrae: "How little," it has been said, "how little is it we know about the character of a dead man we never saw." In these words are expressed one view of the possibility of knowing something of the nature of one who has gone and whom we have never known in the flesh. In one sense they are true, for we have to obtain much of our knowledge through the eyes and impressions of others, but in another sense they fail of the whole truth, for we may know much of a man as revealed to others and described by them, or shown by himself in his writings and deeds.

Perhaps the thought came to many of us during the past year—the three hundredth anniversary of his birth—to wonder what manner of man Thomas Sydenham was. The effort to reconstruct his characteristics from the records which we have of him must have been made by many of us with varying success. We would give much to know more of him, but he has become to some extent a mythical figure. With many similarities to Sydenham, as we know him in his study of disease, it is not possible to predict the place which William Osler will occupy a century in the future. It would interest us if we could know this, but especially if we could foretell how much his memory will be treasured in this hospital and medical school. How much will the student of this school a century in the future know of this man to whom the hospital and school owed so much in its beginnings?

It has seemed to some of us a fitting thing that there should be some memorial, on which the eye can rest, of him whose spirit so pervaded this institution in its early days. To see the representation cannot fail to put into the mind of those who come after some interest in the man. While he has builded a memorial more lasting than brass to his own memory, yet we may aid in keeping that memory alive. It is most appropriate that the presentation of this memorial should be at a meeting of the Historical Club in which he took such a deep interest and which keeps alive the knowledge of by-gone days and men.

In a new country the memorials cannot go back very far. We all know the emotion that stirs us among older peoples when we view the memorials to men

long since vanished or to events long past. If we consider posterity, it is our privilege to erect memorials which may interest them as previous ones have stirred us. For many in this audience it is not necessary to speak of William Osler, for they knew him. Few there are who knew him, if indeed there be any, who would not do what they could to keep his memory alive in the minds of men. To him, I believe, the thought that his name might mean something to succeeding generations of students, far into the future, would have given particular pleasure and satisfaction. This applies especially to medical students in whom his interest was always so keen and friendly. There would seem to be something peculiarly appropriate in the effort to keep his memory alive in the minds of succeeding generations of medical students, for who did more than William Osler to interest men in medical history and in those who had gone before in our profession? In him there was no "inapt derision and neglect of the ancients" but the constant effort to bring them before the student as worthy of honour. Fitting is it, therefore, that we should endeavor to do the same for him. It would be interesting, if possible, to bring home to the minds of all the students here, yes and throughout this land, how much they owe to his work and to his ideas. The stream of clinical teaching had its source in not very remote times. No man did more to deepen and widen its channel on this continent than William Osler. To pursue the metaphor, who can estimate the yield from the fields watered by this stream? Certainly, in his own estimate of what he had done, the influence which he had exerted on the teaching of medicine held a high place.

To those who live here there must often be the feeling of his presence, but in those of us who have changed our habitation and come back, if my sensations are any guide, this is strong. At the front door of the hospital I can see the lithe figure spring up the steps eager to start the day's work. Going along the corridors it seems as if he might come around the corner with his springy walk and the arms waved in greeting. In this room where he often spoke, it seems as if he might come quietly in the door. These are idle thoughts and yet they express the deep impress made by him in the place where he worked. The place that knew him shall know him no more, but the intangible influence continues.

Everyone would agree as to the impossibility of giving to one who had never seen him a true idea of the impression made on others, for so much was in the lighting up of his features. To convey this in impassive bronze is impossible, but Dr. Tait McKenzie has caught much of the characteristic attitude at rest. Many of us can remember his look at a patient after the history had been gone over and the examination made—his features in repose with a look of concentration as if he would pluck the heart out of the mystery. Then, in a moment perhaps, he would begin his discussion of the problem, his face lighting up as thought was translated into speech. It is at such a moment as this, with his mind concentrated on a problem, that the artist has depicted him.

You will remember that he once described a mythical librarian coming across his books in the far future and wondering who Osler was. For the sake of his memory we hope that this may happen only in the very distant future. For the

teachers and students of this institution in the days to come we trust that, seeing this memorial, the memory of William Osler may be kept alive and his spirit may influence those that come after.

There must be on an occasion such as this many thoughts of him whose memory has brought us together. We are not here "to pay honour to the ashes which had been denied to the spirit." Few men can have realized better during life in what honour and love they were held by their fellowmen than William Osler. We did not need his absence to tell us the place he occupied. Time has not made less our sorrow for his passing and the place which he filled in our hearts is as it was, for there can be no change there. Perhaps nothing can better express our feelings tonight than to quote:

> Nothing is here for tears, nothing to wail
> Or knock the breast, no weakness, no contempt,
> Dispraise, or blame, nothing but well and fair,
> And what may quiet us in a life so noble.

And so, Judge Harlan, the fifty subscribers, who were associates and friends of William Osler in the early days of this Hospital and Medical School, ask you to accept this memorial plaque for The John Hopkins Hospital. We hope that it may serve to keep alive, when those who knew him have gone, the memory of one of whom it may well be said: "A man well-beloved."

Dr. Kelly: Judge Harlan will accept the Plaque for the Trustees and subscribers.

ACCEPTANCE OF THE PLAQUE ON BEHALF OF THE JOHNS HOPKINS HOSPITAL AND TRUSTEES

Judge Henry D. Harlan: Dr. McCrae and friends of the beloved Chief: The name of Sir William Osler is linked perpetually with the history of the Johns Hopkins Hospital. The story of his fame as a teacher and student of medicine, which has been set forth so delightfully here tonight, his skill as an organizer of the medical clinic of this Hospital, of his renown as a great master of medicine, will ever be a striking chapter in the annals of this Hospital. A great part of the fame of this Hospital, and what it stands for, of the principles which underlie its progress, of the unity, the concord, and the spirit of work and coöperation that pervade its Staff, of the cordial relations that have existed between its students and instructors, is due to the influence of his inspiration and his example, during the sixteen years while he held here the position of Physician-in-Chief to the Hospital and Professor in the Medical School. This influence has been a compelling, a prevailing influence. What it has meant, the love and the reverence and the affection that it has brought about is nowhere better illustrated than in the group of his early associates and assistants who have united in making possible this Memorial Plaque. Many of them are here tonight.

Sir William Osler is a national and international figure in the world of medicine.

Dr. Osler is remembered in Baltimore as the beloved physician, the friend, the charming comrade, the inspiring teacher, and, Dr. McCrae, I think I may say to you that his memory will long be revered in this Hospital, and this memorial plaque which you have presented on behalf of your associates I have the greatest satisfaction and pleasure in receiving on behalf of the Trustees. To William Osler there is due honor and gratitude, and nowhere more than in these halls.

I have been asked to say that it is not thought the memorial plaque will perpetually remain in the position which it now occupies. When the great Osler Clinic is founded and endowed, it is hoped that this plaque will have an appropriate position in that great building. At least, that is our expectation.

There is possibly one other thought that I might add on this occasion. I do not know that, in any of the papers that I have seen in connection with the debt which the Johns Hopkins Hospital owes to Dr. Osler, due credit has been given to him for the first great gift which the Johns Hopkins Hospital received. When, twenty years ago, sixty-four of the warehouses in which the endowment of the Johns Hopkins Hospital was invested were in ruins as the result of the great fire, when thereby half the income of the endowment was wiped out, I well remember that a few mornings after the fire I met Dr. Osler, and with that wonderful enthusiasm and cheerfulness of which he was capable he turned to me and said: "We must restore it. We can restore it." He sat down and wrote a letter making an appeal to Mr. John D. Rockefeller, through Mr. Frederick Gates, and he got Dr. Welch to write a similar one. That was early in February. Mr. Rockefeller, sent Mr. Starr J. Murphy here to investigate our condition and find out what we were doing, to look at our books and examine us as if we were a railroad in which he intended to invest money. Through Dr. Osler, as a result of that investigation, he offered $500,000 to restore the fire damages, and Dr. Osler undoubtedly had a large part in securing that bequest. I have heard that Mr. Rockefeller's first interest in Dr. Osler grew out of the fact that he had gotten hold of a copy of Dr. Osler's 'Practice of Medicine' and was so much struck with the manner in which he treated of disease in that book that he was attracted to his work and as a consequence of that attraction this gift came to this Hospital. That is another debt which we owe to Dr. Osler.

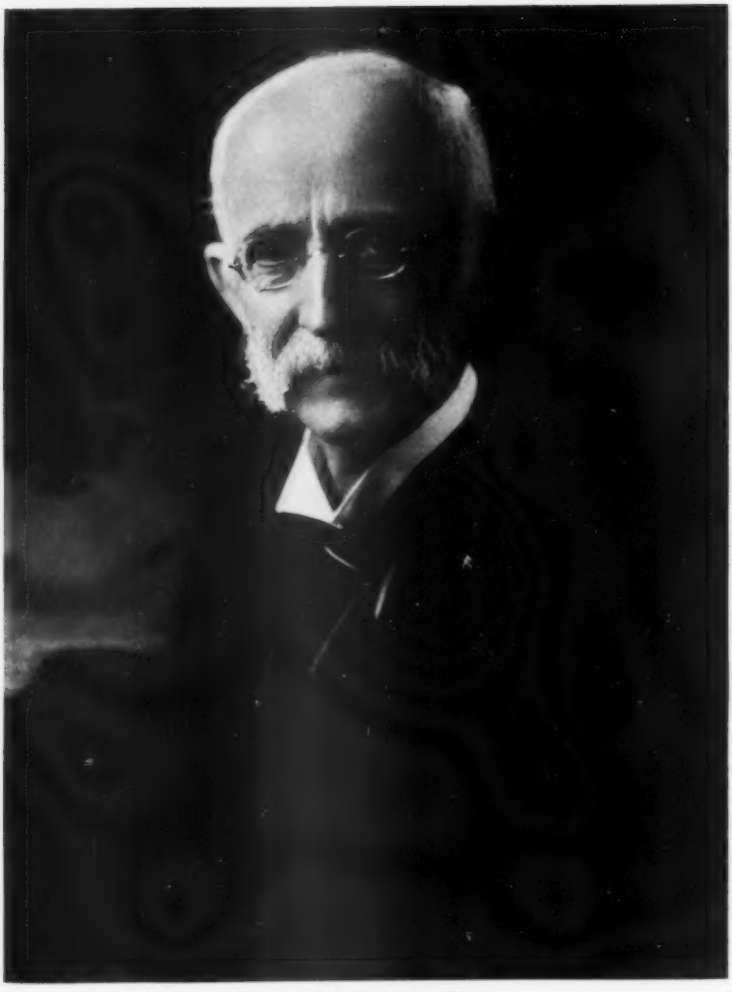
This memorial plaque will long be a precious possession of the Johns Hopkins Hospital.

Dr. R. Tait McKenzie (of the University of Pennsylvania, the artist who executed the plaque): This plaque was executed during the winters of the last two years, and is intended to represent Dr. Osler at a clinical lecture. The hand is stretched out to his microscope which was always his faithful companion.

It was quite impossible to convey in such a medium as bronze the varying play of expression, the peculiar way in which his face would light up, the way his features would change under animation and emotion, and so it seemed better that, since we had to choose one expression or one phase, it should be that of repose or that of concentration which was so characteristic of him.

I feel that in the case of him whom we are honoring tonight—and he has been described so finely in the words of others—I may, perhaps, add a word of my own. He has seemed to me like a great ship that plows its course through the sea of life. After it has passed, the divided waters go back to their place and there is no trace remaining. In a very few years the fog of oblivion dims and obliterates the memory of every man, however great, and it is just and proper that we should meet, as we have met tonight, in order to postpone as best we may the oblivion that steals over the memory of him whom we once knew. We do honor to the profession that he loved, to the mother tongue that he spoke with such grace and wrote with such distinction, and to science whose boundaries he enlarged and widened.

When he was in Montreal a lady once said of him, perhaps in a fit of pique, that Dr. Osler was married to his microscope and that his children were his lectures. And perhaps there was more truth than would at first appear in this statement, because the great teacher lives again in his students and in his students' students. We gather together the shreds of personal experience, personal memories, and we weave them into legends until finally there is established a tradition of the man. You remember that in one of the Acts of The Blue Bird, by Maeterlinck, the stage opens in darkness, and as the light gradually appears, you see a little cottage and in front of it are two old people sitting quietly. They are the dead. As the light increases they begin to move, then they become more animated and the old man says to his wife, "They must be thinking of us." And then their children come in and once more the two old people live as they lived when alive. And then the children leave and the old people go back to darkness and their rest. I cannot but feel that sometimes the spirit of Osler must come back to life here in this City that has so many memories of him; to these corridors which his feet trod so often; to this room where his voice has been so often heard; and especially to a company such as this, composed as it is of those who knew him and who loved him.



Henry Mills Hurd, M.D.

Henry Mills Hurd, M.D.

Dr. Henry Mills Hurd, Emeritus Professor of Psychiatry in the Johns Hopkins University and formerly Superintendent of the Johns Hopkins Hospital and Editor of the *Bulletin of Johns Hopkins Hospital*, died at Ventnor, N. J., on July 18, 1927, and was buried at Utica, N. Y.

After serving as Assistant Superintendent of the Michigan Asylum for the Insane at Kalamazoo, Dr. Hurd was appointed as the first Superintendent of the Eastern Michigan Insane Asylum at Pontiac. This position he held for eleven years, during which he did much to bring that institution into prominence for its sound and progressive methods in the treatment of mental disorders.

In 1889 Dr. Hurd accepted the chair of Psychiatry in the Johns Hopkins Medical School together with the post of Superintendent of the Johns Hopkins Hospital which had just opened its doors for the reception of patients, and was prominent among those leaders who have rendered that institution famous.

After twenty-two years of active service, he resigned from the superintendency but still kept up his close connection with the hospital in the capacity of Secretary to the Board of Trustees, a position which he held until his death.

Besides being eminent as a hospital director, Dr. Hurd was widely known as a leading psychiatrist, a practical writer on mental diseases and as a sane but forceful contributor to the literature of hospital management in all its various branches. As Editor of the *Bulletin of the Johns Hopkins Hospital* he contributed greatly to the early success of that publication.

THE VASCULAR PATTERNS OF TUMORS[1]

WARREN H. LEWIS

From the Department of Embryology, Carnegie Institution of Washington, the Johns Hopkins Medical School, Baltimore, Maryland

Five different types of tumors of the rat were injected with 3 per cent India ink. From one to four tumors of each type were used with somewhat varying results as regards the completeness of the injection. The vascular patterns are very characteristic for each type of tumor. The sarcomata are quite different from the adenocarcinomata. The three different types of sarcoma differ from one another grossly, histologically and angiologically and a glance at the vascular patterns is sufficient to identify each one. The vascular patterns are as characteristic for each one as are the growth phenomena, as well as the gross and the histological appearance. The fibroadenoma, in turn, differs from the sarcoma, on the one hand, and from the adenocarcinoma, on the other, in its vascular pattern as well as in other respects.

These tumors arose spontaneously in Dr. George Walker's rat colony in one strain of rats (strain P). Four of them have been carried on through successive generations by implantations of pieces of the tumor into rats of the same strain. I am much indebted to Dr. Walker for an abundant supply of material and data regarding the history of the tumors.

The technical procedure was as follows: Under ether the thorax was opened and from 4 to 10 cc. of blood withdrawn from the heart with a syringe. Through an incision in the left side of the heart a cannula was introduced into the aorta and from 50 to 100 cc. of 3-per-cent India ink in Locke solution was run into the body with a gravity pressure of two to three feet. The tumors were then cut out and put into 10-per-cent formalin. Free-hand and microtonic sections were run through 50-, 70-, 80- and 95-per-cent alcohol, cleared in modified Eycleshymer fluid (carbolic crystals 1 part, oil of bergamot 2 parts, and cedar oil 2 parts), and mounted in balsam. Ordinary haemo-

[1] Received for publication June 15, 1927.

toxylin and eosin sections were also made. Two fibrosarcomata, one spindle-cell sarcoma, three round-cell sarcomata, one adenofibroma, and four adenocarcinomata were injected. Some of the tumors were multiple, that is, one or more tumors of different sizes, more or less bound together, had developed from each implanted piece.

WALKER FIBROSARCOMA

This tumor was found in August, 1925, in the breast of a rat of strain P. It is necessary to use large implants and the tumors take in 100 per cent of the rats of strain P. The tumors grow slowly, attain a diameter of about 3 mm. in two weeks and a maximum diameter of 150 mm. in the course of 4 or 5 months, after which the rats usually soon die. These large tumors are firm and never show necrotic areas. No metastases have been noted. Re-implantations have been made about every six weeks. The injection of this tumor (30 x 30 x 35 mm.) with India ink was made in February, 1927. The growth belonged to about the twelfth generation.

A section of the injected tumor is shown in Figure 1. Most of the tumor is fairly uniform in consistence, but the center usually contains an excessive amount of fibrous tissue. This figure shows large and small blood vessels which have retained some of the India ink.

The vascular pattern is well shown in Figure 2. The capillary plexus is rich and well supplied with large afferent and efferent vessels. The general type of circulation is much like that of normal subcutaneous tissue.

WALKER SPINDLE-CELL SARCOMA

This tumor was found in August, 1925, in the liver of a rat of strain P. The small implants take in 100 per cent of the rats of strain P. The tumors grow rapidly, attain a size of about 10 x 10 x 30 mm. in two weeks and a maximum diameter of about 120 mm. in 6 to 8 weeks, when the rats usually die. The tumors always have large necrotic centers. Metastases occur in about 20 per cent of the cases. Re-implantations were made about every 2 weeks. The injection of this tumor (30 x 30 x 50 mm.) with India ink was made in December, 1926. The growth belonged to about the thirty-fourth generation.

A section of the tumor is shown in Figure 3. The viable portion of

the tumor is fairly uniform in consistence and forms a peripheral shell about the necrotic area from 3 to 5 mm. in thickness. The vascular pattern shown in Figures 4, 5 and 6 consists of a very rich plexus of fine capillaries, which is almost entirely devoid of large afferent and efferent vessels. Small ones are seen here and there, but none are shown in the figures. Figure 4 shows the capillary plexus just beneath the capsule. In this region the loops tend to be more or less elongated. Figure 6 shows the capillary plexus bordering the necrotic center. The plexus is especially rich where it is close to the necrotic area. Figure 5 shows the intermediate region of the capillary plexus and a small necrotic region bordered by a rich terminal plexus.

WALKER ROUND-CELL SARCOMA

This tumor was found in December, 1926, on the wall of the vagina of a rat of strain P. The tumor was originally an adenocarcinoma but after numerous generations it gradually changed to a round-cell sarcoma. Small implants take in 100 per cent of rats of strain P. The tumors grow rapidly, attain a size of about 10 x 10 x 20 mm. in two weeks, a maximum size of 30 x 30 x 40 mm. in three to four weeks, the animals usually dying soon after. The tumors always develop large necrotic centers and a very thin shell of living tissue from 1 to 2 mm. in thickness. Metastases occur in about 30 per cent of the cases. Re-implantations were made about every week. Injections of tumors with India ink were made in February and March, 1927. The tumors were of the sixtieth to the sixty-fifth generations.

A section of the shell of living tissue which extends from the capsule to the necrotic center is shown in Figure 7. The more vigorous part of the tumor (15 x 25 x 30 mm.) is limited centrally by the zone of injected blood vessels. Larger blood vessels are seen between this zone and the periphery. Between the zone of capillaries and the necrotic center are two zones of tissue which show different stages of degeneration. The vascular pattern of another tumor in a similar condition, shown in Figures 8 and 9, consists of a rich plexus of capillaries that is coarser than that of the spindle-cell sarcoma. The plexus is abundantly supplied with large afferent and efferent vessels. Figures 8 and 9 show such large vessels and also the short distance between them and the terminal rich plexus which borders the zone of

degenerating tissue. Figure 8 shows a few stray capillary loops which extend beyond the terminal plexus into tissue that has not completely degenerated. Figures 10 and 11 from another tumor (25 x 25 x 30 mm.) show areas extending through the entire plexus from the capsule to the terminal plexus near the necrotic center. There are no large afferent and efferent vessels in this particular region.

WALKER ADENOFIBROMA OF THE BREAST

This tumor (30 x 30 x 40 mm.) arose spontaneously in the breast of a rat of strain P, and had attained a size of about 30 x 30 x 40 mm. when it was injected in December, 1926. The tumor was very soft, almost fluid-like on palpation. No implantations were made. There was no necrosis and no metastases were noted.

Figure 12 shows a typical histological section of the tumor which is an ordinary adenofibroma of the breast. This is a section of the injected tumor, but the vascular tree is scarcely to be noticed. The vascular pattern (Fig. 13) shows a highly specialized vascular tree with large afferent and efferent vessels which break up into smaller and smaller vessels to supply the lobes and lobules, and which finally break up into unit capillary plexuses which supply the acini. This type of vascular pattern is not very different from normal.

WALKER ADENOCARCINOMA

This tumor was found in August, 1925, in the thyroid gland of a rat of strain P. Pieces for implantation were taken from a nodule in the lung. Small implants take in 100 per cent of rats of strain P. The tumors grow rapidly, attain a size of about 10 x 10 x 20 mm. in two weeks and a diameter of about 120 mm. in eight to ten weeks when the animals usually die. The tumors have relatively small necrotic areas and give rise to metastases in about 50 per cent of the cases. Reimplantations were made about every two weeks. Injection of the tumor (25 x 25 x 50 mm.) with India ink was made in March, 1927. The growth belonged to about the thirty-fifth generation.

Sections of another non-injected tumor shown in figures 14 and 15 are more or less typical for this type of tumor. Figure 15 from the peripheral part of the tumor consists of small strands of epithelial

cells with relatively small vascular spaces between them and one or two large afferent or efferent bloodvessels. One can readily see how this condition corresponds with the vascular pattern of the tumor injected with India ink (Fig. 16). The large afferent and efferent vessels break up into peculiar plexuses which surround the epithelial strands or lobules. Figure 15, from a section of the same non-injected tumor shown in Figure 14, shows the coarser epithelial strands and vascular spaces in the deeper regions of the tumor. This condition is paralleled by the alteration in the vascular pattern which consists in this region of a coarse sinusoid-like plexus (Fig. 17).

THE RELATION OF VASCULAR SUPPLY TO NECROSIS

Is necrosis due to a deficient vascular supply or to other factors? The fibrosarcoma and the adenofibroma which have an abundance of fibrous tissue and a fairly normal type of circulation do not show necrosis. The spindle-cell and round-cell sarcomata both develop large necrotic centers. The spindle-cell tumor has a much elongated capillary net with a deficient afferent and efferent supply which might conceivably be insufficient to supply the deep-lying cells with the proper amount of blood. The round-cell sarcoma, however, develops even more marked necrosis, and yet it has a rich afferent and efferent supply of blood vessels. The necrotic areas in these tumors presumably had originally a rich blood supply like that in the thin shell of living tissue. It is difficult to see how necrosis could have come about in the round-cell sarcoma through lack of a proper blood supply. It is thus quite possible that necrosis in both these tumors may be due, primarily, to some other factors, such as the continued multiplication of the tumor cells exerting undue pressure on the capillaries or preventing in some way the further penetration of the capillaries into the areas produced by such multiplication. Again, the necrosis may be due to entirely different factors, such as the long continued action of the virus or of toxines on either the tumor cells or the capillaries.

The causes of necrosis in the adenocarcinomata do not depend upon the primary deficiency in the blood supply, for the primary small strands of epithelioid cells at the periphery are at first abundantly surrounded by capillaries with an abundant supply of afferent and efferent vessels. As the epithelial strands increase in size they come

to occupy deeper and deeper positions in the tumor. The capillaries do not seem to have the ability to penetrate into these large strands; hence the epithelial cells in their centers gradually come to lie further and further from the blood supply and ultimately too far for the proper interchange of necessary metabolic materials. The steps from the isolated central alveolar necroses to the large confluent areas are not difficult to imagine.

The capillaries bordering the necrotic areas of the various tumors form as a rule closed loops. Occasionally there was some extravasation of ink into the necrotic tissue, but I am inclined to believe that in such cases the endothelial walls were probably broken by the pressure of the injection fluid.

VASCULAR PATTERNS

These injections show that each of the tumors injected has its own particular type of vascular pattern. Consequently, it seems not unlikely but that every different type of tumor has a vascular pattern peculiar to its type just as does each particular organ in the body. The diagnosis of the type of tumor can probably be made as readily from the vascular pattern as from ordinary sections.

The different vascular patterns of these tumors also illustrate the adaptive and plastic character of the vascular system and its dependence upon its environment. "Of all the structures of the body, the vascular system is one of the most adaptive."[2] No better experimental procedure could be devised to illustrate this point that that produced by nature in tumor formation. The implantations of the small pieces from which these tumors developed were all in the subcutaneous tissue and hence were all surrounded at the beginning by the same sort of a vascular pattern, but each tumor, as it grows, attracts into itself endothelial cells which apparently multiply as the tumor multiplies and form there the vascular trees just as they do in normal-growing tissues of the embryo. The blood vessels do not determine the growth of the tumor; but the tumor determines the growth and the pattern of the vessels.

It is interesting to note that the more purely epithelial tumors,

[2] G. L. Streeter, *Science*, Vol. 65, p. 405–412, 1927.

namely, the adenocarcinomata, develop a large sinusoidal-like circulation not unlike the sinusoidal circulation of the embryonic liver which is composed essentially of strands of epithelial cells.

CONCLUSION

Each type of tumor investigated has its own particular type of vascular pattern that is entirely dependent upon the tumor environment for its formation.

PLATE 1

FIG. 1. Section of Walker fibrosarcoma. Note large blood vessels. Capsule (c). × 55 dia.

FIG. 2. Vascular pattern of above fibrosarcoma. × 55 dia.

FIG. 3. Section of Walker spindle-cell sarcoma. × 150 dia.

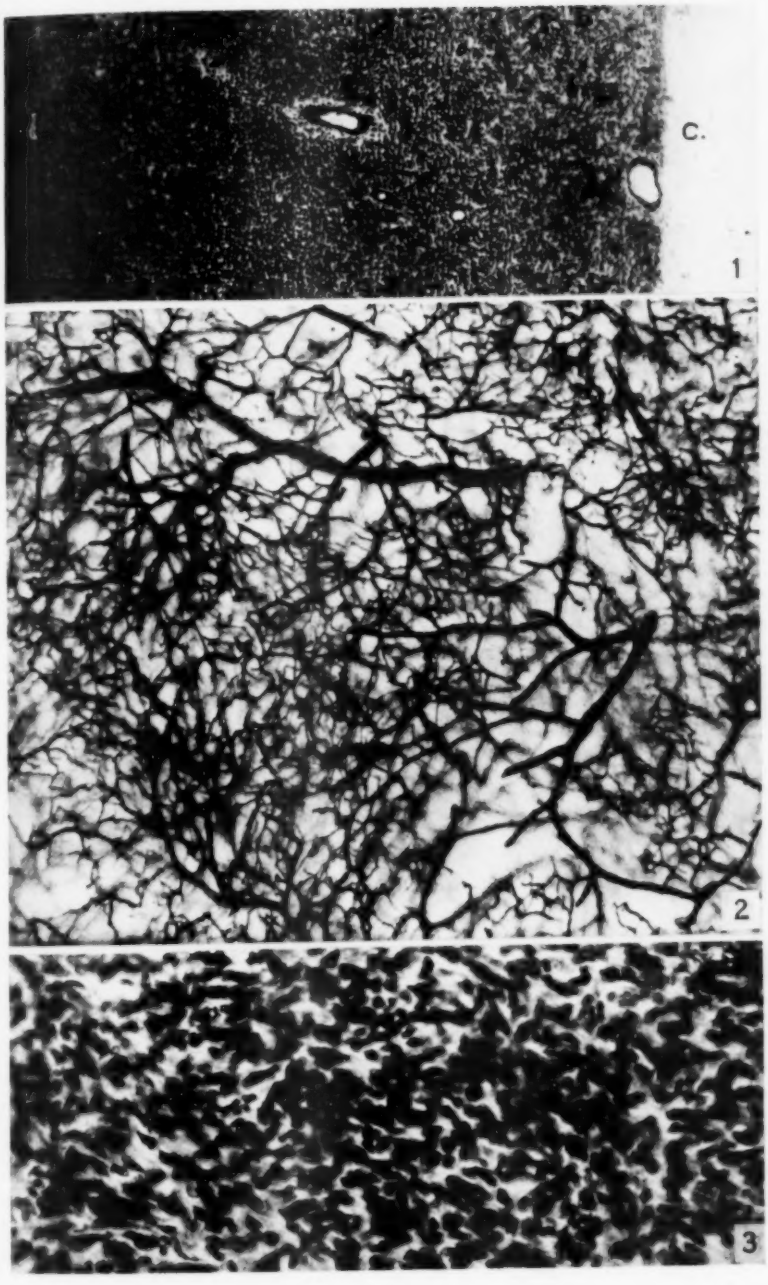

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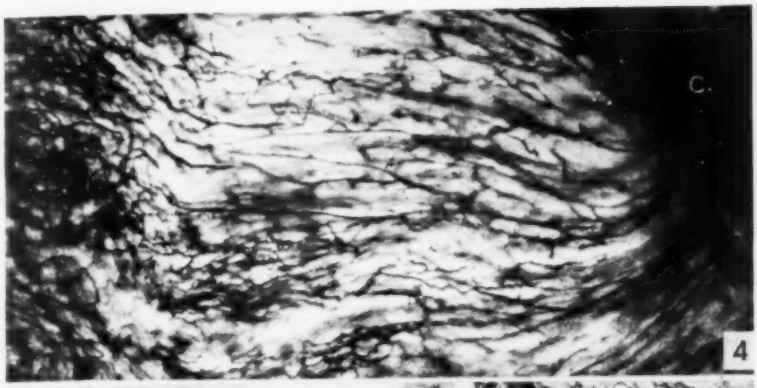
PLATE 2

FIGS. 4, 5 AND 6. Vascular pattern of above spindle-cell sarcoma. Note absence of large afferent and efferent vessels. Fig. 4, capsule (c). Fig. 5, necrotic center (n). Fig. 6, small necrotic area (n), surrounded by rich plexus. × 55 dia.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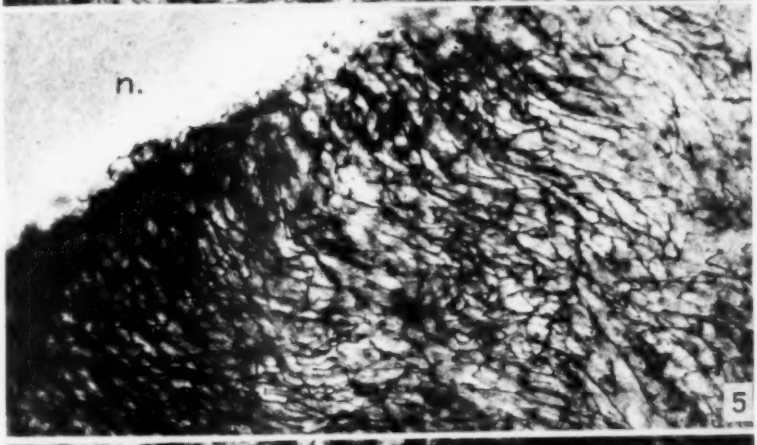
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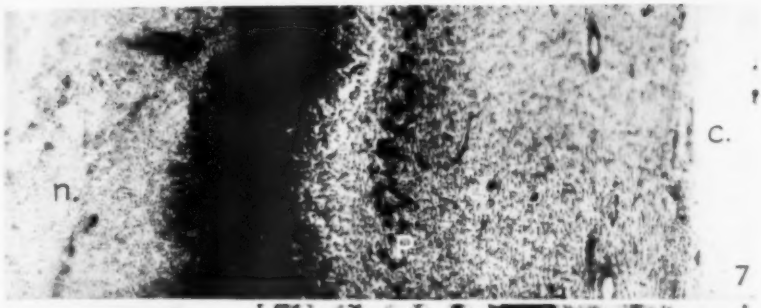
PLATE 3

FIG. 7. Section of Walker round-cell sarcoma. Capsule (c), necrotic center (n) Note terminal capillary plexus (P) near inner edge of living tissue. Between necrotic center and shell of living tissue is a dark band of macrophages. × 55 dia.

FIG. 8. Vascular pattern of above round-cell sarcoma. Note rich supply of afferent and efferent vessels in the thin shell of living tissue. A few capillary loops extend beyond the terminal capillary plexus (P), into degenerating area (d). Capsule (c). × 55 dia.

FIG. 9. Vascular pattern of above tumor. Thin shell of living tissue supplied by rich plexus, which ends in a terminal capillary net (P), near necrotic center (n). Surface (S). × 55 dia.



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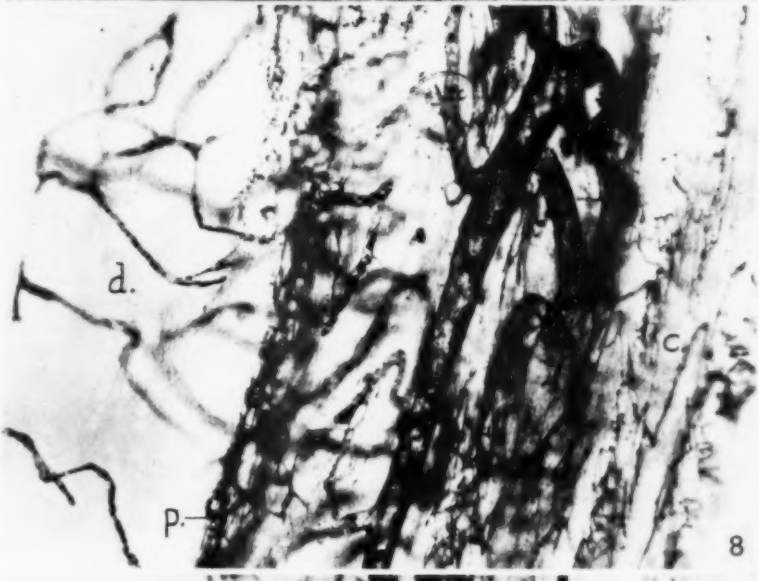

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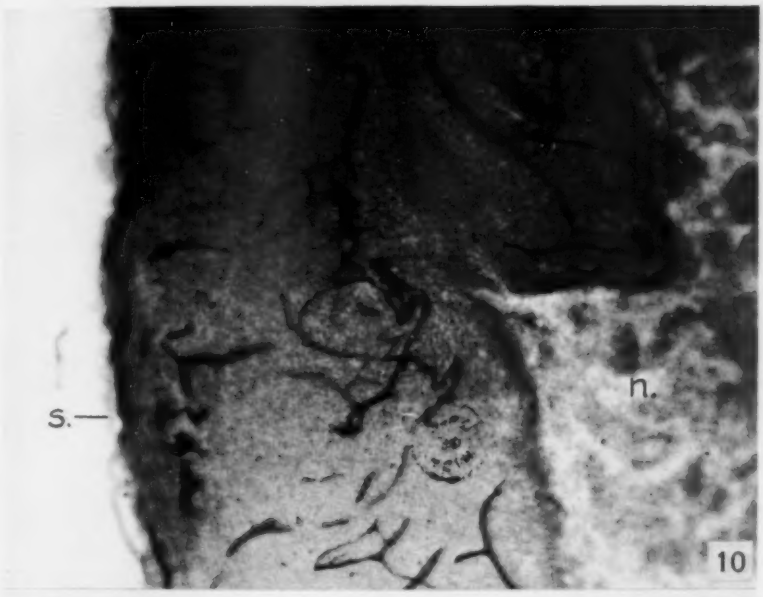
PLATE 4

FIG. 10. Section of above tumor. Note thin shell of living tissue. The blood vessels do not quite reach the necrotic center (n). Surface (S). × 55 dia.

FIG. 11. Vascular pattern of above tumor extending from capsule (c) to necrotic center (n). In this region there are no large afferent or efferent vessels.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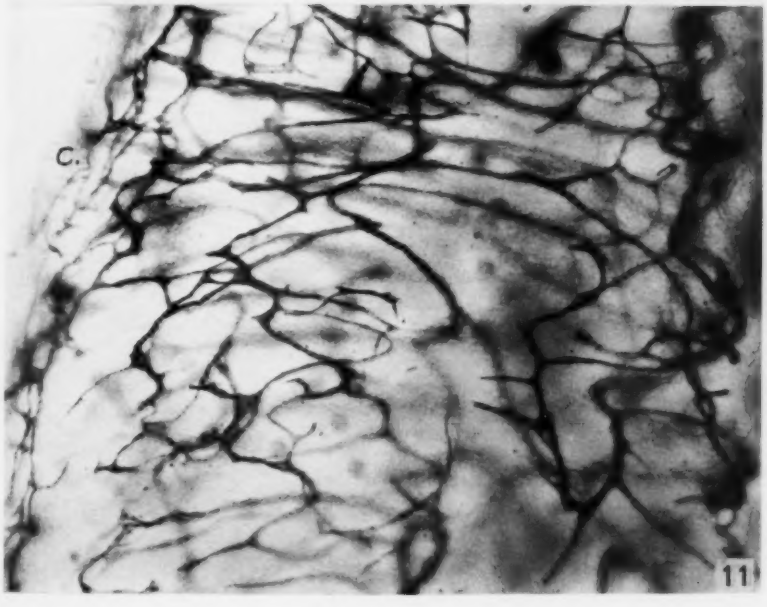
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PLATE 5

FIG. 12. Section of Walker adenofibroma. × 55 dia.
FIG. 13. Vascular pattern of above tumor. × 55 dia.

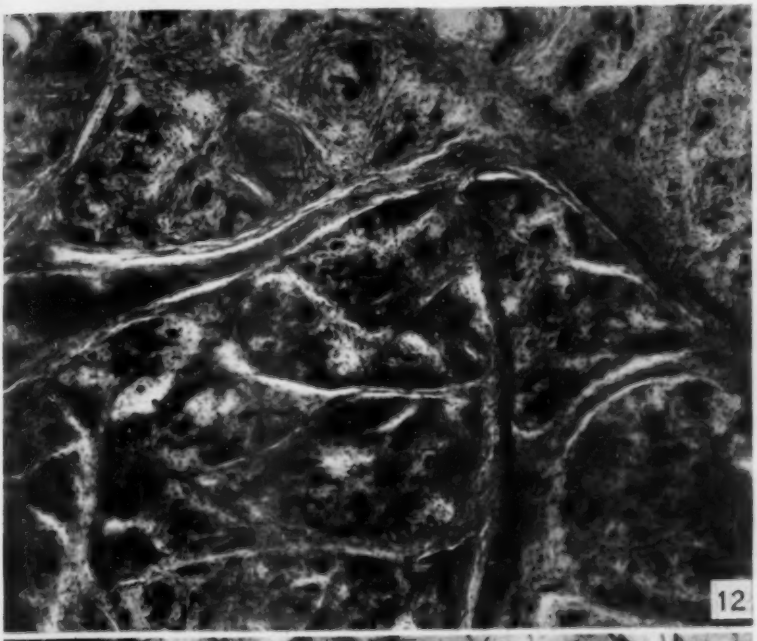
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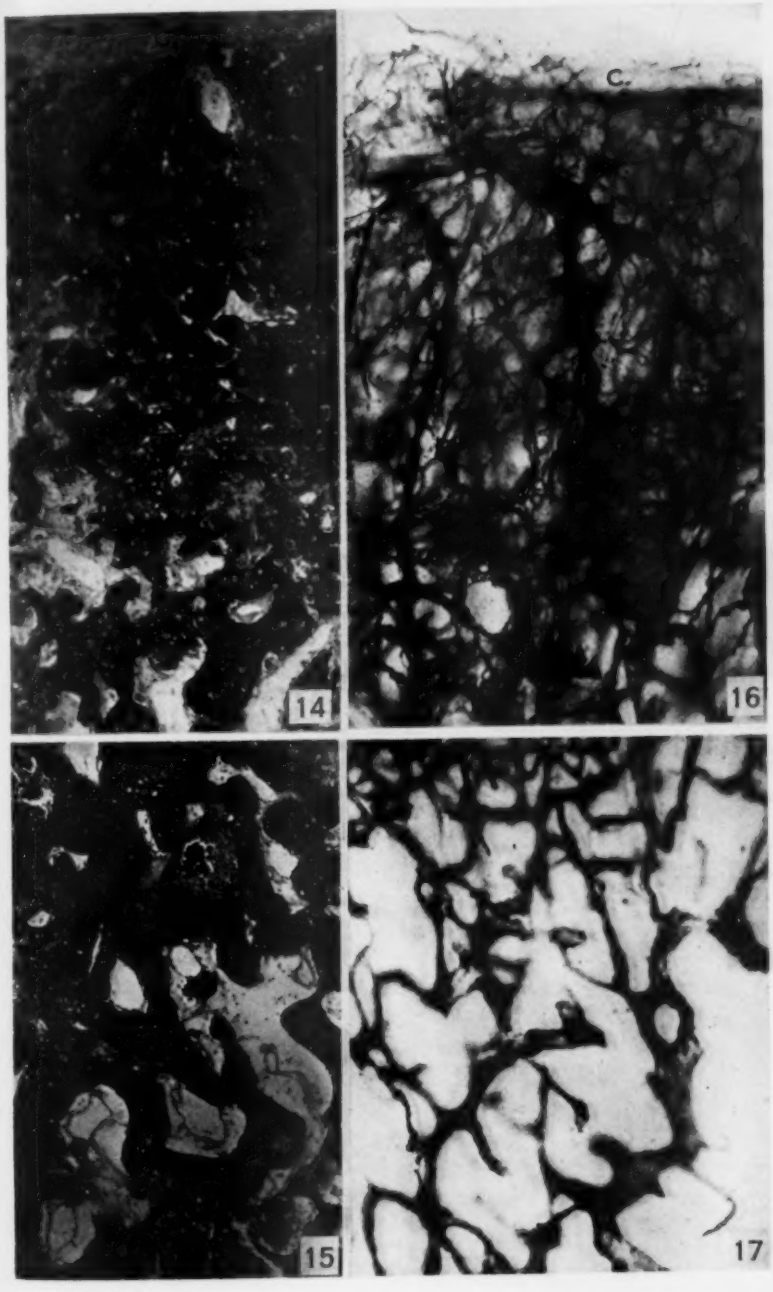
PLATE 6

FIGS. 14 AND 15. Section of Walker adenocarcinoma. Superficial and deeper regions. Capsule (c). × 55 dia.

FIG. 16. Vascular pattern of above adenocarcinoma. Superficial region. × 55 dia.

FIG. 17. Vascular pattern of deeper region of above tumor. Note sinusoidal-like circulation. × 55 dia.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REPORT OF A CASE OF FATAL METHYL SALICYLATE POISONING[1]

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That fatal poisoning with methyl salicylate is of rare occurrence is evidenced by the fact that after a careful search of the literature we were able to find a total of only six cases and only three which came to autopsy. Furthermore, in no recorded case, whether non-fatal or fatal, were we able to find a report of chemical analyses of the blood serum.

The first clinical record of fatal methyl salicylate poisoning we owe to Jewett (1) in 1868. But it was Pinkham (2), in 1887, who first described the pathological changes found at autopsy. Other fatal cases were reported by Mann and Brend (3), Nerthney (4), Legrain and Radonnel (5), and Wetzel and Nourse (6). The last two reports contained descriptions of the pathological lesions.

The outstanding lesions found at autopsy by these authors were fatty changes in the liver and fatty degeneration and cloudy swelling of the tubular portion of the kidneys. One author describes a gastritis, whereas another found the gastro-intestinal tract normal. Subdural and subepicardial hemorrhages and hemorrhages into the lung and pleura were mentioned in one report. Injury to the kidneys is the only lesion recorded in all three autopsy reports.

In our case we were able to study several of the organic and inorganic constituents of the whole blood and serum. Unfortunately, no necropsy was permitted; hence we were denied the opportunity of comparing the chemical with the pathological findings.

The methods of Kramer and Tisdall, and of Kramer and Gittleman, were employed for the determinations of calcium, potassium, and sodium. Chlorine was determined by the method of Whitehorn, and the inorganic phosphorus by the Briggs modification of the Bell

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Doisy method. The CO_2-combining power was determined by the method of Van Slyke.

Analysis for total base was made by the method described by Stadie and Ross. Sugar was determined by the Kramer and Gittleman method. The total protein concentration and the albumin globulin ratio and the non-protein nitrogen were studied by the micro methods outlined by Howe. The blood was also examined spectroscopically for the presence of methemoglobin.

For the sake of brevity, in the clinical report of our case, negative findings are omitted.

Clinical history. J. S., white, male, aged 22 months, admitted to the Harriet Lane Home at 8:30 p.m., April 7, 1927. The family and past history are not essential.

Ten hours before admission he had swallowed an unknown amount, but not exceeding 60 cc., of oil of wintergreen from a bottle which he had found. About five minutes after drinking it, he vomited a considerable amount of the drug. About forty minutes later he was given 2 cc. of the fluid extract of ipecac by a druggist, who reassured the mother. Vomiting continued during the afternoon. The urine had the odor of oil of wintergreen, and this was also evident in a stool passed 5½ hours after ingestion of the drug. Early in the evening the mother, noticing that the child's extremities were cold, became alarmed and brought him to the hospital.

On admission the temperature was 99.6°, pulse 164, respiration 36, weight 12.7 kilos; length 88 cm. The child did not appear to be critically ill. There was an acetone odor to the breath. Inspiration was deep; expiration was through the mouth and blowing in character. The cheeks were flushed, the lips bright, red, and dry. The extremities were cold to the touch. There was no cyanosis. The conjunctivae were injected and the scleral vessels congested. The fundi were normal. The tongue, buccal mucosa, and pharynx were injected. The lungs were clear to percussion and auscultation. The heart was normal in size. The pulse was rapid but seemed to be of good quality. The abdomen was scaphoid in shape. No tenderness was elicited. The reflexes were quite active. He was able to sit and stand alone, though all his actions were slow and deliberate. Sight and hearing were apparently normal.

Blood: White blood cells 25,600; polymorphonuclear leucocytes 81 per cent; hemoglobin 83 per cent; blood Wassermann, negative. No urine was obtainable. The child voided into his napkin shortly after admission, but there was no odor of methyl salicylate.

The cerebro-spinal fluid (obtained by lumbar puncture 20 minutes after death) was clear and colorless; there were 14 cells, all lymphocytes; Pandy (+); Ross-Jones (+); Colloidal gold reaction, negative zone.

Course in hospital. About an hour after admission the patient had a generalized clonic convulsion lasting about 30 seconds. Similar convulsive seizures recurred at intervals of five to twenty minutes for approximately two hours. Each generalized convulsion was preceded by a short, sharp cry, and in the intervals there were occasional twitching movements of the muscles of the hands and face.

There was a gradual development of cyanosis—first of the extremities, then of the lips, and later of the whole skin surface. With the increase in cyanosis the pulse became weaker, more rapid, and irregular. Respiration assumed the Biot type with increasingly long periods of apnoea, and finally ceased four hours after admission, and fourteen hours after the ingestion of the methyl salicylate.

The onset of rigor and livor mortis was almost immediate.

Blood for chemical examination was taken at the onset of convulsions one hour after admission. The chemical determinations gave us the following results:

Calcium	11.2 mgm. in 100 cc. of serum
Phosphorus	10.3 mgm. in 100 cc. of serum
Sodium	290.0 mgm. in 100 cc. of serum
Chlorine	432.0 mgm. in 100 cc. of serum
Potassium	19.8 mgm. in 100 cc. of serum
Carbon dioxide	35.0 volumes per cent in 100 cc. of serum
Sugar	145.0 mgm. in 100 cc. of whole blood
Non-protein nitrogen	62.0 mgm. in 100 cc. of whole blood
Total protein	6.5
Albumin	3.2
Globulin	3.3
Total base.	139 m. Eq. per L.

No methemoglobin was found in the blood.

Clinically, the patient presented a moderately severe acidosis. This was well corroborated by the chemical findings, the CO_2-combining power being low—35 volumes per cent,—and the acidosis being apparently due to a retention of phosphates. This condition has been found to be characteristic of the severe forms of chronic nephritis. According to Howland and Marriott, in chronic nephritis the inorganic phosphorus may go up to four times its normal concentration.

There was also a marked increase in the chlorine element in the serum, but no corresponding increase in the sodium, the latter constituent showing rather a tendency to decrease in concentration. The total base was also diminished in amount. Unfortunately, we did not have enough serum to determine the ammonia concentration of the blood.

Even when the child was in convulsions there was no diminution in the calcium concentration of the serum, such as is commonly found in chronic nephritis as reported by Pincus, Kramer and Peterson.

This case is exceptional also in the fact that in spite of the increase of the inorganic phosphorus concentration in the serum the calcium

remained at a little higher level than normal. In infantile tetany, as shown by Kramer and Howland, in parathyroprivic dogs by Greenwald, and in parathyroprivic dogs and chronic nephritics as shown by Pincus, Kramer and Peterson, the calcium level becomes lower as the inorganic phosphorus increases. We are unable to explain this apparent exception unless it be due to the fact that sufficient time did not elapse for the establishment of such an "equilibrium."

The sugar concentration in the blood was rather high. Because of lack of material we were unable to test for ketone bodies. The total protein was at the lower level of the normal concentration, but it is interesting to observe that the globulin fraction increased, the ratio being about 1:1. The non-protein nitrogen showed a rather marked increase. No methemoglobin was demonstrated in the child's blood.

Comment. Our findings therefore, would suggest that the patient was suffering from a markedly severe renal injury. The acidosis, retention of phosphates and chlorides, and increase in the non-protein nitrogen would certainly favor this view, and would be corroborated by the necropsy findings in the cases reported by Pinkham, Legrain and Badonnel, and Wetzel and Nourse. The albumin globulin ratio is somewhat of the type found by Perlzweig to characterize nephrosis.

The clinical picture and course cannot, however, be entirely explained on the basis of kidney damage. The cyanosis, acetone body formation, convulsions, and rapidly fatal termination cannot have been due to renal insufficiency alone. Undoubtedly, as shown by reports of necropsies, other organs are injured, but it would certainly appear that the kidneys are constantly and most seriously damaged in methyl salicylate poisoning.

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TRANSMISSIBLE TOXICOGENICITY OF STREPTOCOCCI[1]

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As a result of the work of Dick and Dick (1, 2, 3), Dochez (4), Tunnicliff (5), Williams (6), Moser (7), Marmorek (8), Rossiwall and Schick (9), Gabritschewsky (10) and many others, the etiological relationship of beta type hemolytic streptococci to scarlatina may be said to be pretty generally accepted, in the United States at least. However, it must not be supposed that this view is universally held. At least three types of dissenting opinion may be found. First, there are workers who believe, or have believed,[2] that some other type of organism, bacterial or ultramicroscopic, may be the cause. Among these may be mentioned Class (11), Jacques (12), Mallory and Medlar (13), Pryor (14), Caronia and Di Cristina (15), d'Herelle (16) and others. A second view is held by those who believe that the cause of scarlet fever is yet to be discovered. Still a third view is that streptococci may play an accessory rôle.

Streptococci isolated from cases of scarlet fever differ among themselves both culturally and immunologically. The cultural differences extend to carbohydrate fermentations, production of proteolytic enzymes and capsule formation.

Streptococcic infections are generally considered to confer little or no immunity, whereas scarlet fever is a disease which leaves a lasting immunity. It is the view of some that the immunity to scarlet fever may be, in some cases, antitoxic only. However, streptococci from non-scarlatinal sources have been found to produce toxins as active, by skin test, as those produced by scarlatinal streptococci and giving reactions in subjects immune to true scarlet fever toxin. It is thought by some clinicians that persons suffering from non-scarlatinal strepto-

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[2] Some of the authors referred to have changed their opinions since the appearance of the work cited.

coccic infections have, if anything, a heightened susceptibility to infection with these organisms.

Fulminating and also mild cases of scarlet fever are on record from which it has been impossible to isolate hemolytic streptococci. There are other phenomena which have been noted during the study of this disease which tend to raise doubt as to the true etiological significance of streptococci.

It seemed strange that so many different strains of streptococci, not to mention the organisms of Pryor, Di Cristina, Class, and others, could all give rise to toxins which are identical. It was thought possible that the type of organism was, within certain limits, perhaps a matter of secondary importance and that toxicogenicity might be a property that could be acquired by different types of organisms, especially by beta hemolytic streptococci. It was suggested that one strain of streptococci might exert some influence on, or transmit something to, another strain which would cause the second strain to become toxicogenic. Cases are cited in the literature in which one organism, or its products, has affected another in such a way as to render the second organism agglutinable with serum which formerly had agglutinated only the first. Otto and Sukiennikowa (17) reported such phenomena as occurring among members of the colon-typhoid group, and Cantacuzene and Boncieu (18) recently reported a similar occurrence among streptococci.

To test the possible effect of one streptococcus on another, experiments were outlined for the purpose of exposing hemolytic streptococci of non-scarlatinal origin and known, by repeated tests, to produce no toxic reaction in the subjects used, to the influence of toxicogenic scarlatinal streptococci. The two types were cultivated in mixed culture and these cultures plated and colonies fished. In order to differentiate the non-scarlatinal from the scarlatinal strain, it was necessary to secure strains which differed culturally from the scarlatinal. Also, in order to be sure that the non-scarlatinal strain was really a pure culture after having been fished from mixed culture with the scarlatinal one, it was found necessary to select strains which lacked some character possessed by the scarlatinal strain and which possessed some peculiarity lacked by the scarlatinal one. Any mixed colonies fished would then exhibit the cultural characters of both

strains. A pure culture of the non-scarlatinal strain would fail to exhibit the scarlatinal character while exhibiting its own. Cultures might be impure and yet have so few of the scarlatinal cells as to fail to give any of the scarlatinal reactions. But if the scarlatinal organisms were present in such small numbers as to fail to make themselves evident culturally, it seems unlikely that any of the results with skin tests could have been due to the growth of these organisms. Further, it was found that the scarlet fever strain was either rapidly overgrown by, or rapidly overgrew (depending on which strain it was associated with) the non-scarlatinal strain, so that as a result of the antagonism between the organisms, mixed cultures seldom existed for more than 24 or 48 hours. The five-day incubation period of the colonies tested for toxicogenicity, therefore, practically eliminated the possibility of a mixed culture.

TABLE I

Characters differentiating the scarlatinal from the non-scarlatinal streptococci

ORGANISM	MANNITE FERMENTATION	HISTASE PRODUCTION	SOLUBLE HEMOLYSIN	TOXIN (SKIN TEST)
Scarlatinal strain	−	+++	++++	++++
Strain No. 10	+	−	−	−
Strain No. 2081	+	−	++++	−

After searching through a considerable number of strains of streptococci, two were found which had the desired characteristics. The characters differentiating them from the scarlatinal strains are shown in Table I. The strain designated as No. 10 was obtained from Dr. Avery of The Rockefeller Institute in New York, who isolated it from cream cheese. Strain No. 2081 was obtained from Dr. Bundeson of the Chicago Health Department, and was isolated from market milk. The scarlatinal strain was obtained from Dr. Bayne-Jones of the University of Rochester. The toxin-producing powers of these strains were tested several times on different occasions by cultivating them for five days in tryptic digest bouillon, filtering, testing the filtrate for sterility and then injecting intracutaneously 0.1 cc. of the filtrate diluted from 1 to 25 to 1 to 1000. No reactions were obtained in any test with the non-scarlatinal strains, whereas the scarlatinal strain

always gave a definite test. It may be noted in passing that repeated injections of toxin into the same spot did not seem to develop any immunity to the toxin injected.

A tube of tryptic digest bouillon (referred to hereafter as P.D.B.) was inoculated with one drop of a young culture of strain 10 and also with one drop of a similar culture of scarlatinal streptococcus (referred to hereafter as strain X). Another tube of P.D.B. was likewise inoculated with strains 2081 and X. Both of these mixed cultures were incubated for 48 hours at 37°C. Blood-agar pour plates were then made with broth dilutions of these cultures. After twenty-four hours' incubation of the plates 18 colonies were fished from the one containing strain 10, and 24 colonies from the plate containing strain 2081. Each colony was transferred simultaneously to differential media as follows: Mannite bouillon, cooked meat (for histase production as described by Frobisher (19)) and P.D.B. bouillon. Three P.D.B. cultures of strain 2081, whose corresponding cultures in mannite bouillon showed acid but whose cultures in cooked meat showed no evidence of histase production, were selected as pure cultures of this organism. In selecting proper P.D.B. cultures of strain 10, tests were first made by the method of de Kruif and Ireland (20) for the presence of soluble hemolysin. Six cultures showing no hemolysin production and fermenting mannite were selected as being pure cultures of strain 10. The corresponding P.D.B. cultures of these colonies were tested for toxicity in the manner noted above. Dilutions of 1 to 100 were used. Antitoxin controls were made by mixing equal quantities of concentrated antiscarlatinal serum and filtrate and allowing the mixture to stand at room temperature for one hour, before diluting and injecting. The results of these tests are recorded in Table II.

These results seemed to indicate a definite acquired toxicogenicity on the part of the non-scarlatinal streptococcus. The toxin seemed to be scarlatinal in nature, since it was neutralized by antiscarlatinal serum. (Toxin-antitoxin reactions in scarlet fever seem, however, according to recent reports, to be less specific in nature than those of some other diseases such as, for example, diphtheria.) It also seems that not every colony of the exposed non-scarlatinal streptococcus gives rise to toxicogenic cultures and those that do seem to vary in their toxicogenicity.

Stock cultures were made of the colonies of the non-scarlatinal strains which showed acquired toxicogenic powers. These were kept on infusion blood-agar slants in the refrigerator for three or four months with monthly renewals. At the end of this time the toxicogenic properties were found to have vanished completely. The cultural characters remained unchanged.

The whole experiment was repeated. The results obtained were, in nearly each detail, identical with the previous ones. A different test subject was used in this experiment.

TABLE II

Skin reactions obtained from non-scarlatinal streptococci after growth in mixed culture with scarlatinal strains

STRAIN NUMBER	SUBJECT B*		SUBJECT F*	
	Antitoxin	No antitoxin	Antitoxin	No antitoxin
2081. Col. 1	−	+	±	++
2081. Col. 2	−	+	±	++
2081. Col. 3	−	+	−	+
10. Col. 1	−	+	−	+
10. Col. 2	−	−	−	±
10. Col. 3	−	+	−	+
10. Col. 4	−	±	−	+
10. Col. 5	−	−	−	±
10. Col. 6	−	−	−	−

*Subject B. was much less sensitive to the toxins than subject F.

+ = an inflamed area between 2 and 3 cm. in diameter. ++ = an inflamed area between 3 and 4, cm. in diameter. ± = a doubtful, and − a negative reaction.

The effect of the filtrable growth products of the scarlatinal streptococcus upon the non-scarlatinal was investigated. In each experiment a broth culture of the scarlet fever streptococci in P.D.B., 24 hours old, was passed through a tested Berkefeld "V" filter. The filtrate was tested for sterility and inoculated with the non-scarlatinal streptococci. This culture was incubated for 48 hours. A loopful of this culture was then transferred to a second tube of P.D.B. Three hours later a loopful of this was transferred to a third tube and from this, three hours later, a loopful was transferred to a fourth tube of P.D.B. In this way toxin from the original scarlatinal filtrate was

eliminated. This was checked by making parallel transfers with the uninoculated, sterile, scarlatinal filtrate. The third sterile transfer never gave any skin reaction. Sometimes the first and second transfers would give a slight reaction. The inoculated serial subcultures were incubated for five days and tested for toxicity with antitoxin controls as described above.

A number of experiments of this general type were run. The skin reactions obtained were, as a rule, less definite than those obtained in the mixed culture experiments but indicated that scarlatinal filtrates influenced the non-scarlatinal strains to become toxicogenic. This would suggest the existence of a filtrable second factor associated with the scarlatinal streptococci. This phase of the subject is being investigated further.

Some attempts were made to transmit toxicogenic powers to organisms other than streptococci by the mixed culture method. These failed. The organisms used included one strain of Staphylococcus albus, two strains of B. coli, one of B. prodigiosus, one of B. subtilis and two strains of Hemophilus hemolyticus. The cultures of B. coli and B. prodigiosus gave non-specific reactions. The strains of H. hemolyticus did not survive contact with the streptococcus.

SUMMARY

Non-toxicogenic, non-scarlatinal streptococci and strains of B. coli, B. prodigiosus, B. subtilis and S. albus have been cultivated in mixed culture with toxicogenic, scarlatinal streptococci and then recovered in pure culture. Two non-scarlatinal streptococci were found to have acquired, temporarily, a definite toxicogenicity, giving rise to a toxin which is neutralized by anti-scarlatinal serum. The other organisms did not acquire any toxicogenicity.

Non-toxicogenic streptococci may acquire a toxicogenicity from sterile Berkefeld filtrates of the scarlatinal types, although the toxicogenic powers so acquired are, in general, less marked than those acquired from the mixed cultures. The existence of a filtrable second factor associated with the scarlatinal streptococci is suggested.

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BOOK REVIEWS

Applied Anatomy. By Sir Frederick Treves, Bart. Eighth edition, revised by C. C. Choyce, M.D., Edin., F.R.C.S., Eng. 727 pp. (*Lea and Febiger, Philadelphia and New York, 1927.*)

It is a pleasure to greet this classic in Surgical Applied Anatomy in its latest form. Written by a surgeon, revised and re-written by the anatomists Keith and Mackenzie, and now further revised by a surgeon, this book presents most satisfactorily the surgical application of anatomical studies. It is a valuable text-book for teachers and students, and for the clinician a mine of readily accessible information.

The present edition has been considerably amplified by Doctor Choyce, particularly from the point of view of clinical surgical diagnosis. There are twenty-five more pages than in the previous edition and the index has been correspondingly increased. The reviewer would have been glad to see more complete descriptions of the sensory nerve distribution, with reference to the approach for nerve-blocking for typical operations, inasmuch as that procedure typifies an important phase of surgical anatomy. The book is, after all, so full that this deficiency will be unnoticed unless particularly sought for.

Any recommendation of a book which first appeared in 1883, and has now reached the eighth edition, would seem superfluous. Doctor Choyce, however, is to be congratulated on the excellent result of his revision, and we again welcome what seems to be a hardy perennial in surgical literature.

E. M. H.

Immunity in Syphilis. By Alan Chesney, M.D. 85 pp. $2.50. Medicine Monograph XII. (*The Williams & Wilkins Company, Baltimore.*)

A review of this important subject is necessitated by the author's own experimental work, which may revolutionize the hitherto almost universally accepted idea of immunity in syphilis. Since Neisser's elaborate experiments with apes, it has been generally believed that there is no such thing as lasting immunity against syphilis; that susceptibility to a fresh infection means that the original infection has been cured, while on the other hand refractoriness to fresh infection indicates the persistence of active foci of syphilitic infection somewhere in the body. In connection with his own experiments the author has subjected Neisser's work to a searching critical analysis, which might well serve as a model of how to interpret scientific data. Chesney's experiments have done much to demolish Neisser's concept, and to suggest that in rabbits, at least, there may be such a thing as an acquired immunity resulting from syphilitic infection which persists in the absence of demonstrable infection. The importance of this new theory of immunity

against syphilis from the clinical standpoint is manifest; at once the prognosis of treated syphilis becomes brighter.

The monograph is by no means limited to the exposition of the data leading to this conclusion, but is thoroughly inclusive from the historical, experimental and clinical standpoints. It is full of suggestions for further investigation of unsolved problems in its field, and cannot but stimulate the thoughts of the syphilologically minded. A full bibliography is appended.

This Volume XII of the series of Medicine Monographs is well up to the standard set by its predecessors. The idea of the monographic handling of intricate subjects in the medical field is one which has always appealed to the reviewer; and the Editors of "Medicine" are to be congratulated on the high standard they have set.

J. E. M.

Examination of Children by Clinical and Laboratory Methods. By ABRAHAM LEVINSON. Second edition. 192 pp. $3.50. (*The C. V. Mosby Company, St. Louis. 1927.*)

This book should be very helpful to the practitioner as well as the student of pediatrics. To the beginner, the chapters on case histories and the details of physical examination will prove extremely valuable. Exact descriptions of all necessary laboratory methods are accurately given and easy to follow. The book is not merely a compilation of facts but a valuable supplement to any textbook on pediatrics.

P. E. R.

Muscular Contraction and the Reflex Control of Movement. By J. F. FULTON, PH.D. Harvard University. 644 pp. $10.00. (*Williams & Wilkins, Baltimore, 1926.*)

"Muscular Contraction and the Reflex Control of Movement" is an intensive discussion of muscle nerve physiology—the relation of the contraction of muscle to the simple reflex activity of the spinal cord. The author considers in detail the most recent contributions to that ever-expanding field, which uses electricity not only for the activation of nerve or muscle but also for the recording of their delicate responses. This portion of the book is well balanced and the treatment is critical, because here the author is dealing with his own field of research. His own experiments increase the worth of his discussion.

The historical introduction is valuable, not only because it gives a complete résumé of the growth of this particular division of physiology, but also because it bears evidence of the writer's careful study and real appreciation of important contributions. He estimates very ably the various circumstances which have made those contributions—experiments then—classical work now. The reproductions of frontispieces or illustrations, taken in large part from his own collection, enhance the interest not a little.

If the chapters on the morphology of muscle and nerve endings are read critically, it is evident that the author has not had the advantages of first-hand information. The same may be said of the discussion of the morphology of the cerebellum and also of the chapter entitled "The Nature of Higher Control." Here, the stream of erudition that marks the greater part of the book runs low; and the author's knowledge is slight, when judged by the standard established by his previous discussion. It was impossible to encompass completely the gigantic task which the writer had set himself. The alternatives, which he might have taken, would have been either to omit the consideration of certain subjects altogether, or to have chosen a collaborator. Undoubtedly, however, the reading necessary for their writing has given the author a keener interest in fields outside his own, and were he to become conversant with the material itself, would modify his conception of the mode of action which he assigns to nerve endings in muscle.

Dr. Fulton is to be congratulated. He has written a book which is valuable not only to the physiologist, but also to the morphologist, who needs to know a little something of the results obtained by the present attempts to measure the activity of nerve and muscle.

M. H.

Chronic Rheumatic Diseases, Their Diagnosis and Treatment. By F. G. THOMSON and R. G. GORDON. 202 pp. $2.75. (*Oxford University Press, London, 1926.*)

In this 200-page volume on rheumatic diseases Thomson and Gordon have contributed a nice piece of work to the literature of the subject. They have given a concise summary of the present day ideas of arthritis, but have added little that is new to the student of these problems.

The different types of arthritis are taken up with the main points in their differential diagnosis and treatment. The classification used is good and comprehensive. There are four main groups: (1) Fibrositis, (2) Infective Arthritis, (3) Osteoarthritis, and (4) Gout. The clinical types are further divided to include lumbago, brachial neuritis, sciatica, and intercostal neuralgia. An arthritis found in women about the menopause, and attacking chiefly the knees, is described under the title of 'climacteric arthritis.'

Under a separate part headed 'Diagnostic Difficulties,' the following are discussed: (1) Static deformities, (2) New growths, (3) Diseases of the central nervous system, (4) Certain diseases of bones and joints, and (5) Referred pain due to diseases of the viscera. Principles of therapy are taken up with a little more detail, and include the use of drugs, waters, baths, climate, baking, massage, electricity, vaccines, diet, and orthopedic treatment.

All the various problems are discussed, but no one subject is gone into very deeply. The book is written in a very entertaining manner, and its greatest field of usefulness will probably be as a text for the medical student and general practitioner.

A. R. S., JR.

The Enlarged Prostate. By KENNETH M. WALKER. 1st. edition. 193 pp. $4.00. (*Oxford University Press, New York, 1926.*)

Apparently written primarily for the general surgeon, who also does urology, this book contains the opinions, methods and operative procedures advanced by the leading urologists of the profession, but fails to describe the definite results obtained by the author in their application.

The illustrations are largely copied from other works on urology or are represented by pen-and-ink diagrammatic sketches. There are no photomicrographs to show malignancy of the prostate.

The chapters on anatomy, physiology and pathology contain merely a brief review of the current literature on the subjects.

In the part devoted to diagnosis the author gives the stereotyped methods of diagnosing benign prostatic enlargements. Insufficient stress, however, seems to be laid on the differential diagnosis of malignancy, and the detection, by means of the x-ray, of calcareous deposits and metastases to the lumbar spine. No mention is made of sarcoma of the prostate.

The section on non-surgical treatment is interesting and at times amusing.

The author's view-point in the matter of surgical procedures is well illustrated by the fact that approximately 50 pages are devoted to suprapubic prostatectomy and the procedures that lead up to and follow it, while only 9 pages are devoted to the perineal method. Probably as a result of this, the treatment of carcinoma by radical prostatectomy in the hopes of permanent cure, and by partial prostatectomy for relief of obstruction, is not dealt with. The technique of radium application in carcinoma is also missing.

His choice of spinal anesthesia, in preference to the simple, harmless extradural technique, is probably a result of this suprapubic preference.

Marked modifications and improvement in the technique of the perineal operation are not described. However, we heartily concur in the author's statement that "if the operator has no special knowledge of the perineal route, the suprapubic operation should always be preferred."

One misses the new methods of decompressing residual urine, the latest urinary antiseptics and the simpler methods of determining the blood urea.

To the urologist the most interesting part of the work is the section on "The Diathermy Punch." In designing and giving to the profession this instrument, the author has done a fine piece of original work. It enables one to remove obstructions from the neck of the bladder without hemorrhage and under direct vision. It would seem to solve the difficult urological problem of contracture of the vesical orifice.

The book will be very helpful to the general practitioner and contains useful hints to the general surgeon.

R. W. McK.

The Clinical Examination of the Nervous System. By G. H. MONRAD-KROHN. Third edition. Pp. 201. $2.50. (*Paul B. Hoeber, Inc., New York.*)

This is the third edition of an already well known book. Since the appearance of the second edition a French translation by Dr. R. Mourgue has appeared in France. The author gives an excellent introduction to neurological examination. In this new edition a chapter on the pharmacological tests of the vegetative nervous system and descriptions of the pilomotor and postural reflexes are added.

The parts on the mental examination might be more adequate.

F. I. W.

Gynecological Diagnosis and Pathology. By A. H. F. BARBOUR and B. P. WATSON Pp. 223, with 8 colored plates and 201 figures. Cloth, $4.00. (*Wm. Wood & Company, New York.*)

There are, so far as the reviewer know, only two modern books in English on the subject of gynecological pathology, that of Barbour and Watson being one. It is a useful book, but if, in the new edition, the authors have aimed to bring the work up to date, they have failed rather lamentably. While the general plan, the paper, and the typography are excellent, a good deal of the material is of an old and stereotyped vintage. The chapter on diseases of the endometrium detracts from other portions that are excellent. The obsolete descriptions of the menstrual histology and the omission of any description of such an important condition as hyperplasia, in the sense in which the term is commonly used, are only two of a good many irritating instances of a similar kind. The most discussed subject in gynecological pathology during the past five years—pelvic endometriosis—is not even mentioned. Such inadequacies are unforgivable in a new edition, and seem especially irritating in view of the excellent treatment of many of the subjects. It might so easily, it seems, have been made into a really out-standing work.

E. N.

A Textbook on Exodontia, Oral Surgery and Anesthesia. By LEO WINTER, D.D.S., Professor of Oral Surgery, New York University College of Dentistry; Oral Surgery, Flower Hospital; Lecturer on Oral Surgery, New York Homeopathic Medical School. 329 illustrations. $7.50. (*The C. V. Mosby Company, St. Louis, Mo.*)

This is an entirely new book, but the subject with which it deals is one of the oldest and, possibly, the most important in the whole range of dental practice. No operator can know too much about extractions, for upon his ability to remove teeth quickly, skilfully and more or less painlessly, will depend, to a great extent, the measure of success.

Dr. Winter seems to give a technique for the removal of practically every tooth in the mouth, and, as one reads the text and studies the numerous illustrations, one is tempted to conclude that the extraction of teeth is, after all, not a very

difficult operation. For instance, pages 324 to 332 are taken up with a description of the removal of a completely impacted lower third molar, and the operation is so beautifully illustrated that it seems quite simple. The extraction of many other teeth is also well described and illustrated.

Local anesthetics are adequately described in the chapters on anesthesia. There is also a very useful chapter on toxicity, symptoms and the treatment of intoxication by the local anesthetics, a subject which is not always fully borne in mind by the dental surgeon. The technique of injections is well described and excellently illustrated.

Other chapters deal with accidents and infections following local anesthesia, the control of bleeding in surgical operations in the mouth, dislocation of the jaw, impacted mandibular canines, premolars, first and second molars, periodontal infections, cysts of the jaws, and other conditions.

The book is excellently produced, and the large print and good paper make it easy to read. However skilful one may be in the science and art of extracting teeth, the study of this book cannot fail to be of great advantage.

H. H. S.

Manual of Bacteriology. By ROBERT MUIR, M.D., Sc.D., and JAMES RITCHIE, M.D., F.R.C.P., with the coöperation of Carl H. Browning, M.D., and Thomas J. Mackie, M.D. Pp. 821. $4.75. (*Oxford University Press, London, 1927.*)

In the nine years which have elapsed since the appearance of the last edition of this manual many valuable contributions have been made to our knowledge of Bacteriology. These have necessitated considerable additions to textbooks on the subject. The authors of the present volume, in addition to greatly improving the sequence of material from a pedagogical viewpoint, have incorporated a number of new features. There is a concise statement of the main facts concerning *Bacteriophage*, a review of most of the important recent works on scarlet fever, a page on the problem of mutations, a whole new section on filtrable viruses, with a review of work on measles, herpes, epidemic encephalitis and Rocky Mountain fever. None of these are found in the older edition. There is a new section on the estimation of hydrogen-ion concentration and the adjustment of the pH of culture media. The older methods are still regarded by these authors as more satisfactory for most purposes.

In the chapters on immunity a brief statement of Besredka's new ideas regarding local immunity has been incorporated. There is also some discussion of recent work in connection with the phenomena of agglutination and specificity, and several other matters.

The recent system of nomenclature of the Society of American Bacteriologists is recognized throughout, although the older names are also given for convenience. A valuable feature of the book is, as in the past, its classified bibliography.

As for style, the discussions are, for the most part, clear, concise, free from

dogmatism and cover the subject in a manner quite adequate to the purpose for which it is intended,—as a textbook for medical students. There are statements with which all readers might not agree. There are also omissions. For example, the chapter on *Streptococci* leaves something to be desired. The subject of milk streptococci might be enlarged with advantage and the classification of streptococci and of the anaërobic bacteria seems somewhat abridged.

As a whole, the book is fairly complete and up to date and should take rank as one of the several first-rate textbooks of medical bacteriology.

M. F., Jr.

Heart and Athletics. By Felix Deutsch, M.D., and Emil Kauf, M.D. Translated by Louis M. Warfield, M.D. 187 pp. $2.50. (*The C. V. Mosby Company, St. Louis, 1927.*)

The authors report an extensive series of observations made upon the hearts of athletes at the Vienna Heart Station. The individuals studied have been divided into two groups; those who exercise simply for pleasure and do not undergo serious training; and those who train strenuously for competitive sport. The effect upon the size of the heart relative to that of the body as a whole has been carefully followed, in some cases for fifteen years. The writers wisely minimize the importance of changes in auscultatory findings as compared with alterations in heart mass.

For the physician who is called upon to judge the fitness of a patient for competitive athletics, this book affords a carefully prepared background for comparison.

E. C. A.

Clinical Methods. By Robert Hutchinson and Harry Rainy. Eighth Edition. 688 pp. $5.00. (*Paul B. Hoeber, New York, 1924.*)

"Clinical Methods," thoroughly revised, has been compiled for the express purpose of assisting novices in diagnostic clinical work. One is carried through every aspect of the subject from history-taking to all kinds of laboratory work, and a rather successful effort has been made to present only such material as is essential. The inclusion of a section on detailed neurological examination is peculiarly fortunate in view of the tendency of many of us to relegate that important phase of medical examination to the neurologist, without first making a complete study on our own part. It would seem that this book is worthy of a place as a ready reference for hospital internes, and can be profitably used as a stepping-stone to the more detailed works on physical diagnosis, clinical pathology, and medicine generally.

B. W. L.

Pediatrics. Edited by Isaac A. Abt. 381 pp. $2.25. (*The Year Book Publishers, Chicago, 1926.*)

This small volume is one of the Practical Medicine Series issued annually by the

publishers. In it an attempt is made to abstract from a prodigious literature all articles of "practical" value and pertinent to the subject. In such an undertaking the discriminating judgment of a specialist in the field is necessary, and it is enough to say that Dr. Abt has succeeded admirably. One particularly commendable feature is the critical discussion which precedes the abstracts of articles concerning certain more lively current topics, among which might be mentioned sickle-cell anemia and the etiology of measles. As an aid to keeping abreast of the times, such a book has distinct value.

B. W. L.

Anatomical, Phylogenetical and Clinical Studies on the Central Nervous System. By B. BROUWER, Professor of Neurology, University of Amsterdam. Pp. 62. $2.50. (*The William & Wilkins Co., Baltimore, Md.*)

This little volume contains three lectures delivered at Johns Hopkins University, April 1926, under the auspices of the Herter Foundation. The first embodies a brief, but lucid, résumé of some recent experimental work on the projection of the retina on the primary optic centers in the mid-brain, which the author has carried out with the help of Zeeman. The second deals with some problems in the pathology of sensibility, and the third is an illuminating attempt to apply phylogenetic principles in the study of selective atrophies of the cerebellum and of that common but mysterious condition, disseminated sclerosis. Neurologists will find much that is stimulating and much that is instructive in this booklet which contains, at least in summary, some of the author's most important contributions to medical science.

F. R. F.

BOOKS RECEIVED

Surgical Nursing and the Principles of Surgery for Nurses. By RUSSELL HOWARD C.B.E., M.S., F.R.C.S. Fifth edition. 1926. 8°. 320 pages. Edward Arnold & Co., London. $3.00.

Applied Pharmacology. By A. J. CLARK, M.C., B.A., M.D., F.R.C.P. Second edition. With 54 illustrations. 1927. 8°. 430 pages. P. Blakiston's Son & Co., Philadelphia. $4.00.

Bacteriological Atlas. A Series of Coloured Plates Illustrating the Morphological Characters of Pathogenic Micro-organisms. By RICHARD MUIR. 1927. 12°. 134 pages. William Wood & Co., New York. $4.50.

The Modern Practice of Pediatrics. By WILLIAM PALMER LUCAS, M.D., LL.D. 1927. 8°. 962 pages. The Macmillan Company, New York. $8.50.

Principles of Chemistry. An Introductory Textbook of Inorganic, Organic and Physiological Chemistry for Nurses and Students of Home Economics and Applied Chemistry, with Laboratory Experiments. By JOSEPH H. ROE, Ph.D. Illustrated. 1927. 8°. 378 pages. The C. V. Mosby Company, St. Louis. $2.50.

Exophthalmic Goitre. By JOHN EASON, M.D., F.R.C.P.E. 1927. 8°. 215 pages. The Macmillan Company, New York. $2.25.

Tiger Trails in Southern Asia. By RICHARD L. SUTTON, M.D., Sc. D., LL.D., F.R.S. (Edin.). With 115 original illustrations. 1926. 8°. 207 pages. The C. V. Mosby Company, St. Louis. $2.25.

Management of the Sick Infant. By LANGLEY PORTER, B.S., M.D., M.R.C.S. (Eng.), L.R.C.P. (Lond.) and WILLIAM E. CARTER, M.D. Third revised edition. Illustrated. 1927. 8°. 726 pages. The C. V. Mosby Company, St. Louis. $8.50.

Examination of Children. By Clinical and Laboratory Methods. By ABRAHAM LEVINSON, B.S., M.D. Second edition. With eighty-five illustrations. 1927. 8°. 192 pages. The C. V. Mosby Company, St. Louis. $3.50.

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The Harvey Lectures. Delivered under the Auspices of the Harvey Society of New York, 1925–1926. By DR. F. R. NAGER, DR. JOHN H. NORTHROP, *and others*]. Series XXI, 1927. 8°. 229 pages. The Williams & Wilkins Company, Baltimore. $4.00.

Dental Materia Medica and Therapeutics. With Special Reference to the Rational Application of Remedial Measures to Dental Diseases. A Textbook for Students and Practitioners. By HERMANN PRINZ, A.M., D.D.S., M.D., Sc.D. Sixth edition. Enlarged and revised according to the United States Pharmacopeia, tenth decennial revision. 1926. 8°. 632 pages. The C. V. Mosby Company, St. Louis. $6.00.

The Fifth Avenue Hospital Clinic. First series, based on the material from the semi-monthly staff meetings MCMXXV. Illustrated. 1927. 8°. 336 pages. Paul B. Hoeber, Inc., New York City. $5.00.

Should We Be Vaccinated? A Survey of the Controversy in its Historical and Scientific Aspects. By BERNHARD J. STERN. 1927. 12°. 146 pages. Harper & Brothers, New York. $1.50.

A Text-Book of Medicine. By American authors. Edited by Russell L. Cecil, A.B., M.D. Associate editor for Diseases of the Nervous System. Foster Kennedy, M.D., F.R.S.E. 1927. 8°. 1500 pages. W. B. Saunders Company, Philadelphia. $9.00.

The Normal Chest of the Adult and the Child. Including Applied Anatomy, Applied Physiology, X-ray and Physical Findings. By J. A. MYERS. In collaboration with S. Marx White, R. E. Scammon [*et al.*] With an introduction by Elias P. Lyon. 1927. 8°. 419 pages. The Williams & Wilkins Company, Baltimore. $5.00.

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The Evolution of Tubercle. By ALLEN K. KRAUSE. 1927. 12°. 95 pages. Journal of Outdoor Life, New York. $1.00.

Lehrbuch der Physiologie. In Vorlesungen. VON EMIL ABDERHALDEN. I. Teil. Mit 92 Abbildungen im Text. 454 pages; II. Teil. Mit 166 teils farbigen Abbildungen im Text und 3 farbigen Tafeln. 520 Pp. 1925. 8°. Urban u. Schwarzenberg, Berlin. M. 18.,; M.24.

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Publication of the State Historical Society of Wisconsin. Hollister Pharmaceutical Library, Number One. A Facsimile of the First Edition of the the Pharmacopoeia Augustana. With Introductory Essays by Theodor Husemann. 1927. 4°. 260 pp. Madison.

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Bone Sarcoma. The Primary Malignant Tumors of Bone and the Giant Cell Tumor. By ANATOLE KOLODNY, Ph.D., M.D. 1927. 4°. 214 pages. Authorized by the American College of Surgeons, The Surgical Publishing Company of Chicago, Chicago.

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Heart and Athletics. Clinical Researches Upon the Influence of Athletics Upon the Heart. By DR. FÉLIX DEUTSCH and DR. EMIL KAUF. English translation by Louis M. Warfield, A.B., M.D. 1927. 8°. 187 pages. The C. V. Mosby Company, St. Louis. $2.50.